The Newspaper of Information Systems Management
February 20, 1995, Vol. 29, No. 8, 162 Pages, $6/Copy, $48/Year

COMPUTERWORLD

Denied!

Decree rejected; Microsoft, DOJ unite

By Stuart J. Johnston and Mitch Betts

Microsoft may be down, but it's not out.

Prodded by California attorney Gary Reback and his three anonymous software company clients, U.S. District Court Judge Stanley Sporkin last week rejected out of hand the proposed consent decree between Microsoft Corp. and the U.S. Department of Justice.

But before the week was out, a feisty Microsoft had teamed up with its former nemesis — the Justice Department — to appeal Sporkin's ruling (see chart below) and request a speedy appeals process.

If an appeal is granted, oral arguments could be presented to the court before June, although a ruling is likely to be months away. Microsoft counsel William Neukom said.

The request for the appeal will put on hold a March 18 court date scheduled by Sporkin because the appeals process normally preempts any lower-court proceedings, Neukom said. Sporkin's hearing would likely deal with procedural issues surrounding the case.

Users, Wall Street indifferent

Meanwhile, Reback's stunning upset of what is ordinarily a rubber-stamp process appears to be having little impact on users and investors (see stocks, page 151).

If not resolved soon, the case will likely take years to wend its way through the courts. With that in mind, several users said it will not upset their plans.

"Why would it [affect users]?" asked Arthur Tisi, chief

Denied, *page 14*



Judge Sporkin's ruling

The settlement was rejected primarily for the following four reasons:

1. **Justice Department "stonewalling"**
"The government, time after time, has refused to provide the court with information concerning the substance of ... what it investigated and the findings it made."

2. **Narrow scope**
"Neither party has addressed the court's concern that the decree be expanded to cover all of Microsoft's commercially marketed operating systems."

3. **Ineffective remedy**
"Simply telling a defendant to go forth and sin no more does little or nothing to address the unfair advantage it has already gained."

4. **Weak compliance mechanism**
"Microsoft's position is that its 50 or so in-house lawyers, along with its outside retained counsel, are sufficient to monitor the decree. This is the same group that has advised its client that 'product preannouncements' to impede competition is proper behavior."

Newspaper
#BXBBJFT######## CAR-RT SORT ** C03S
#UIU7ZE300M099039# 0010113473
UNIVERSITY MICROFILMS INT 0002
UNIVERSITY MICROFILMS INT 0012 6 XC
SERIAL PUBLICATIONS
300 N ZEEB RD
ANN ARBOR MI 48103-1553

Object-oriented frameworks

Oracle floats plan

By Kim S. Nash

REDWOODSHORES, CALIF.

After years of talking a good object game, Oracle Corp. is still talking. But last week, at least, the database firm revealed specific plans to enter the object-oriented playing field, with a framework designed to let users model and build true object applications.

Code-named Sedona, the framework will not show up until the second half of next year, Oracle officials confirmed.

The development environment will include a complex repository, relational-object mapping facilities, programming tools and project management utilities, among other products (see chart). The components are intended to communicate via published application programming interfaces and object specifications from Oracle, Sun Microsystems, Inc. and other vendors, said Sohaib Abbasi, senior vice president of Oracle's tools division.

Oracle's Sedona

- **VISUAL PROGRAMMING TOOLS** to model and build reusable data and business logic objects
- **SERVER-BASED REPOSITORY** to store, track and pass messages to objects and to unite Oracle's CDE, Power Objects and other tools
- **OBJECT MEDIATOR** to link Oracle's object tools and framework to those from other vendors, such as Sun's Project DOE

Sedona will work with existing Oracle 7 databases as well as with the forthcoming Oracle 8, Abbasi said. Oracle 8 is expected to include an object translation layer riding atop a relational engine.

Is this for real?

Most users and analysts interviewed last week took a skeptical show-me stance, noting that Oracle 8 and related object plans have been a favorite topic — but hardly real products — of Oracle Chief Executive Officer Larry Ellison for

Oracle, *page 153*

Users build client/server benchmarks

By Rosemary Cafasso

At the height of the mainframe era, benchmarks and other performance yardsticks made it easy to distinguish the high-performing systems from the clunkers.

Not so in client/server. Currently, there are no industry guidelines to give users even a reference point to help separate the winners from the losers.

Instead, it is up to users to figure out how to comparison shop for client/server applications.

"There's no metric to use because there are so many components," said Terry Thornton, director of financial systems at Vanstar Corp. in Pleasanton, Calif., which installed Platinum Software Corp.'s client/server financial software. "The only true way is to put the software up and run it and test it on actual transactions."

Several client/server software companies have recently taken to releasing their own benchmarks on a variety of items, including num-

Users, *page 153*

IBM drops RAID boost; costs, complexity may rise

By Craig Stedman

IBM has changed the rules on users of its Ramac mainframe disk array in the middle of the game. As a result, upgrading to higher-capacity disk drives due to ship by midyear will be more complicated — and perhaps costlier — than Ramac customers had been led to expect.

IBM confirmed last week that it has scrapped plans to increase the amount of Ramac RAID capacity that can be attached to its 3990 Model 6 controller beyond the current 180G-byte maximum. Budgetary limitations and performance issues played a role in the decision, the company said.

IBM previously told Ramac buyers that 3990 Model 6 support would be doubled when the new 4G-byte StarFire disks hit the market. These disks would allow companies to increase capacity simply by adding drives. But now, customers with a full Ramac configuration will have to add another controller, and that forces a number of trade-offs (see chart page 16).

"This kind of leaves IBM with some egg on its face," said Wayne Pattison, director of data center operations at Kansas City Southern Railway Co. in Kansas City, Mo. "It's unlike IBM. They don't usually tell you they're going to do something and then go back on it."

The change of plan, Pattison added, "is one more reason why I don't think I made a mistake" by spurning Ramac and choosing a competing RAID platform for an upcoming storage purchase. He declined to identify the product he expects to buy for contractual rea-

IBM, *page 16*

Louis V. Gerstner
Chairman and CEO
IBM
Armonk, N.Y.

Dear Mr. Gerstner,

Ever wonder what customers think of the job IBM is doing? We give you heartfelt letters from IS managers about the pros and cons of dealing with your company.

See In Depth, page 124

A PUBLICATION OF IDG

What's Inside

February 20, 1995



LIFE in the FOREIGN LANE



NICK KELSH

The challenges for U.S.-based IS executives working for foreign multinationals go well beyond linguistic and cultural issues. These executives must take a backseat role in top technology decisions and a leadership role in adopting new technologies — and deal with licensing and procurement issues. **See Management, page 117.**

NEWS

■ The FBI has tracked down a man it claims is a notorious **hacker**. *Page 4*

■ IBM targets Sun's Solstice **enterprise management platform** with a trio of distributed networking announcements. *Page 4*

■ A new AT&T unit will offer network business consulting, integration and outsourcing. *Page 6*

■ IBM reaffirms its plan to put a Unix interface on top of OS/2. *Page 10*

■ **Borland** launches its Delphi application development environment. *Page 15*

■ **Intel claims its next-generation P6** processor will offer a significant improvement over Pentium-based systems. *Page 16*

■ Wall Street is the target for a **wireless mobile** computing package. *Page 24*

DESKTOP COMPUTING

■ A test-drive review shows that **Hewlett-Packard's latest color notebook**, OmniBook 4000, is comparable to IBM's ThinkPad but with a lower price. *Page 39*

WORKGROUP COMPUTING

■ **Hewlett-Packard** looks for new workstation users in an old HP market. *Page 85*

ENTERPRISE NETWORKING

■ Microsoft says the next release of its **Systems Management Server** will be closely tied to Windows 95. *Page 91*

LARGE SYSTEMS

■ **Hitachi Data Systems** is emulating IBM's tape libraries. *Page 101*

APPLICATION DEVELOPMENT

■ A vendor consortium is out to prove that applications can be built out of modular, **reusable software components**. *Page 113*

CAREERS

■ Companies are still **testing applicants** for mainframe proficiency as well as newer technologies. *Page 129*

MARKETPLACE

■ Don't let **currency exchange rates** get you down when buying equipment. *Page 144*

COMMENTARY

■ **Charles Babcock** notes that Tandem has turned itself around by taking advantage of commodity chips and finding new market outlets. *Page 8*

■ Real people are still worried about big iron, says **Paul Gillin**. *Page 36*

■ Data gurus, hold on. Your time is at hand, say **Gary Heil** and **Tom Parker**. *Page 37*

■ Data everywhere but not a drop to drink, laments **Max D. Hopper**. *Page 37*

How do you measure up?

How does your IS department compare with the Computerworld Premier 100? Fill out the Premier 100 survey, and we'll send you a free report showing how your operation compares with Premier 100 averages. Consolidated information from the surveys we collect may be published in a future Premier 100 issue. Send a request on company letterhead to Paul Gillin, Editor, Computerworld, 375 Cochituate Road, Framingham, Mass. 01701 or E-mail to survey@cw.com.

COMING NEXT WEEK



As organizations move away from a traditional hierarchical structure, IS managers must rethink the politics of management. The premier issue of *Computerworld*'s new monthly Leadership Series features Paul A. Strassmann on "Governance: The new IS agenda."

Calendar ..... *Page 123*
Company Index ..... *Page 150*
Editorial/Letters to the editor ..... *Page 36*
Feb. 17 Stock Ticker ..... *Page 151*
How to contact Computerworld ... *Page 154*

Executive Briefing

After years of talking a good object game, Oracle plans to enter the object-oriented realm with a multipiece framework, code-named **Sedona**, designed to let Oracle users model and build true object applications, Oracle officials said. Due later this year, the development environment reportedly will include a repository, relational-object mapping facilities, programming tools and project management utilities, among other products. *Page 1*

With no independent industry guidelines available for client/server benchmarking, users need to find their own way. The benchmarks and other performance yardsticks that made life easier in the mainframe era don't work in the **client/server** world, leaving managers with no reference point to help separate the workhorse systems from the clunkers. They have to make their own solutions to the benchmark dilemma when comparison shopping for client/server applications. *Page 1*

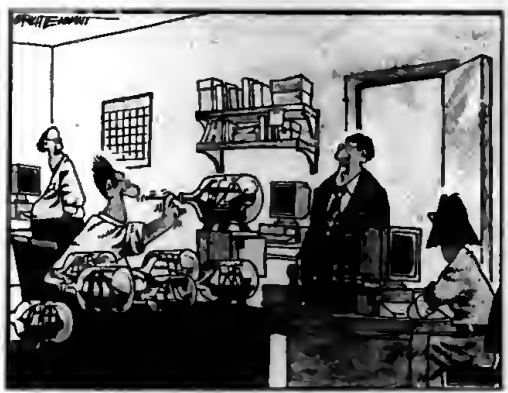
A study of World-Wide Web usage shows that the vast majority of people cruising the Web are looking for information, not spending opportunities. Only 18% of overall respondents spent more than $50 in on-line purchases in the previous six months. *Page 6*

While there are no signs of users getting off the data warehousing bandwagon, many are still unclear on the best approach. However, some users are considering rollouts of on-line **analytical processing** into data warehousing strategies. *Page 12*

Desktop videoconferencing is most easily cost-justified by companies that are migrating from room-based systems. Others are drawn to the lure of cost savings and increased productivity and efficiency, but most of the activity is in pilots. Widespread deployment is two to three years away. *Page 81*

To provide its customers with one-stop shopping, **Chase Manhattan Bank** has installed a middleware package designed to ease the exchange of data among business units. *Page 101*

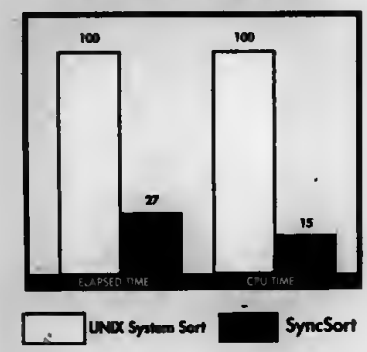
The 5th Wave *by* Rich Tennant



"WHO'S GOT THE COMPUTER WITH THE SLOW RESPONSE TIME?"

The UNIX System Sort

PERFORMANCE



FUNCTIONS

	UNIX System Sort	SyncSort
RECORD FORMATS		
Fixed length binary	NO	**YES**
Variable length binary	NO	**YES**
ASCII Text	YES	**YES**
RECORD PROCESSING		
Selection	NO	**YES**
Reformatting	NO	**YES**
Summarization	NO	**YES**
Grouping	NO	**YES**
COLLATING SEQUENCES		
Standard ASCII	YES	**YES**
EBCDIC	NO	**YES**
User Defined	NO	**YES**
Multi-byte	NO	**YES**

UNIX has its advantages, but its System Sort isn't one of them.

All it can do is sort ASCII text – slowly!

SyncSort provides the performance and functionality you need to make your commercial UNIX applications work.

To order SyncSort or for a FREE copy of our booklet – *Making Your Commercial UNIX Applications Work* – call us.

syncsort

(201) 930-8200 dept.123



XINU

FBI nabs notorious hacker

By Mitch Betts and Gary H. Anthes
SAN DIEGO

Score one for the good guys.

Kevin D. Mitnick, a 31-year-old fugitive hacker thought to have cracked open dozens of corporate and government computers since 1982, was arrested by agents of the Federal Bureau of Investigation last week at his home in Raleigh, N.C.



But computer security experts at the Internet Society Symposium on Network Security here last week warned users not to gloat. The sophisticated high-tech crimes attributed to Mitnick will become more common as the hacking craft becomes ever more automated, they cautioned.

The criminal charges against Mitnick are access device fraud and computer fraud, including the snatching of thousands of credit-card numbers from the Internet. Kent Walker, assistant U.S. attorney in San Francisco, will prosecute the case.

According to an affidavit from FBI Special Agent Levord M. Burns, the cyber-manhunt went into high gear when Andrew Gross, a systems/network administrator at the San Diego Supercomputer Center, reported a Christmas Day 1994 intrusion into the files of computer security expert Tsutomu Shimomura. The intruder used known but apparently heretofore unused techniques called "IP spoofing" and "session hijacking" to get in [CW, Jan. 30].

The hacker then added backdoor access programs to Shimomura's computer, allowing the intruder to copy files, including advanced security software that other hackers could exploit. One of the files was Unix network monitoring software developed under a grant from the National Security Agency in Fort Meade, Md.

Some of Shimomura's files, as well as a compressed file of stolen credit-card numbers, wound up stored on the servers of The Well, an Internet access provider in San Francisco.

"The Well's files were not compromised or stolen, but some old and unused accounts became a storage bin for files that were stolen from other systems," a Well spokeswoman said. The huge amount of storage space occupied by the illicit files tipped off Well technicians.

The Well then allowed Shimomura and the FBI to use a back room outfitted with three laptop PCs to monitor the hacker's activities, the spokeswoman said.

Tracing his tracks

The credit-card numbers were stolen from Netcom On-Line Communication Services, Inc. in San Jose, Calif., another Internet access provider that helped authorities with the electronic chase. The FBI affidavit alleged that Mitnick, to cover his tracks, used cellular modems to dial in to Internet access lines across the country. But the cellular numbers were eventually traced to Mitnick's new apartment in Raleigh.

"Spoofing and [session] hijacking have been known for a decade, but now people are using [automated tools] to make active attacks," said Paul A. Lambert, a computer security official at Motorola, Inc. who attended the security conference here.

Passive attacks are those in which the intruder listens in on network traffic; active attacks involve generating or changing data. In the Supercomputer Center hijacking, IP packet headers were modified to fool Shimomura's computer into thinking the hacker traffic was coming from a trusted computer.

Stephen T. Kent, chief scientist for security technology at Bolt Beranek and Newman, Inc. in Cambridge, Mass., said the tools commonly used for Internet security are good for authenticating a user when the initial connection is made. But they do not guard against hijacking attacks, in which the session is later grabbed by an intruder.

Hijacking attacks require "network layer authentication" in which every data packet is authenticated cryptographically, Kent said. "If companies don't do this, I predict we will see more and more of these active attacks."

Victimized

The FBI's affidavit noted that one of superhacker Kevin D. Mitnick's victims was *New York Times* writer John Markoff, whose electronic mail was read and then deleted. The intruder also made Markoff's Internet account accessible to anyone and activated "backdoor hacking tools to obtain root superuser status on the machine," the affidavit said.

IBM polishes Karat for distributed net management

By Jean S. Bozman

■ IBM is preparing a trio of announcements for the rollout of its Karat enterprise management platform for distributed systems.

The computer giant's move to add systems management capabilities to its NetView networking management systems will come in waves, as a unified set of applications fans out to IBM's strategic platforms — MVS, AIX, OS/2 and OS/400 — by mid-1996.

IBM faces three-way competition with Sun Microsystems, Inc., which announced its Solstice line in January, and Hewlett-Packard Co., which is developing the Tornado enterprise management platform to extend OpenView. All three vendors plan to move to object-oriented platforms that consolidate data on a global basis and receive network and system alerts from a variety of third-party software packages.

IBM said last week the rollout will occur in the following stages:

■ This spring, IBM will release Karat, and IBM's systems management applications will be unified under a single console. All major IBM platforms will be supported by mid-1996.

■ By midyear, IBM will publish application programming interfaces (API) for third-party software vendors and large users that plan to write systems management applications. Simple Network Management Protocol Version 2 will be supported by NetView for AIX, supporting manager-to-manager updates.

■ Sometime this fall, IBM will move toward an object-oriented management architecture, taking steps to integrate NetView with Tivoli Systems, Inc.'s object management framework for systems management. IBM licensed the Tivoli technology last year [CW, April 11, 1994].

The new Karat enterprise management platform will include IBM's NetView products, along with their APIs, to maintain upward-compatibility for independent software vendors and current NetView users who may later decide to migrate to the enterprise management platform.

The APIs will enable multiple NetView management consoles to cooperate with other vendors' consoles, IBM said. That would include cooperation with HP's OpenView, analysts noted. NetView consoles running on different operating systems already communicate with one another and can update multiple geographically dispersed NetView consoles, IBM said.

IBM users deploying Unix servers in distributed client/server environments find themselves with a growing need for distributed NetView.

Distributed capabilities "will become very important to us within a year and a half as we set up remote hospitals and rural health clinics with RS/6000s to run their systems," said Don Bricker, a network administrator at Methodist Hospital in Lubbock, Texas. "In small MIS departments, we only have one person in each [hospital] capable of using NetView. When one of them goes on vacation, they [could] hand off to the central site or to another department."

But analysts said NetView pricing will have to be adjusted for distributed use. That is because it will be far more expensive to run NetView and its follow-on, Karat, on mainframes than on Unix and OS/2 servers. Even now, NetView for AIX costs $16,500, NetView for OS/2 costs $4,995, and MVS mainframe NetView costs $800 to $2,535 per month. MVS mainframe NetView is priced from $40,000 to more than $140,000, depending on mainframe size.

Simplicity is key

At the same time, IBM is wrestling with an internal matter: how to winnow down the number of applications that will run across mainframes and Unix servers. In all, there are 160 different IBM network and systems management packages.

"One of IBM's problems has been they have too many systems and not enough applications that work across many systems," said Richard Villars, director of network management research at International Data Corp. in Framingham, Mass.

"The key word is simplify," said Barbara Sannerud, research director of the Gartner Group, Inc.'s Systems Software Technology group. "We'll hear them simplifying their message, and we'll see them doing some of that this spring."

Sources in the analyst and user communities said last week they believe IBM also plans to incorporate Distributed Computing Environment (DCE) middleware into all flavors of NetView, whether for the mainframe, Unix servers or PC LAN servers. That way, NetView can leverage DCE's security, timing and directory services to coordinate and secure global data networks.

Senior editor Steve Moore contributed to this story.

Corrections

Due to an editing error, the Jan. 30 "Guide to RAID Storage Devices" did not clearly note the capacity of EMC Corp.'s Symmetrix models. The Symmetrix 5500-3's capacity is 360G bytes. The 5500-9's capacity is 1T byte.

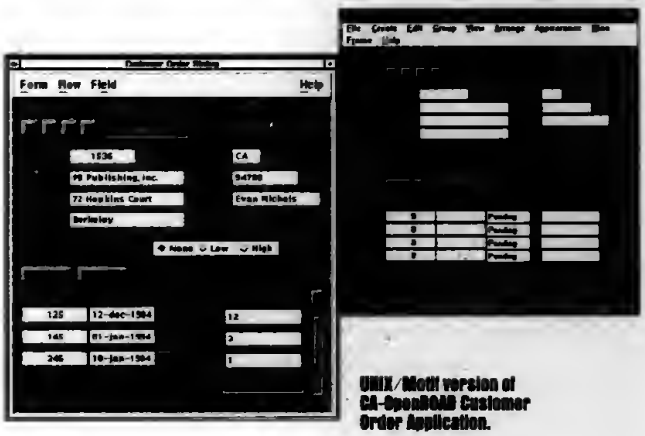
Due to a reporting error, the chart for "Vendors fudge on product ship dates" [CW, Feb. 6] incorrectly stated that Informix Software, Inc. promised to deliver an application partitioning feature last November in Release 1.11 of its New Era development tool. Informix did promise that feature but plans to deliver it this summer.

Due to an editing error, a chart in the February issue of *Client/Server Journal* was incorrect. The ratings on the Novell, Inc. NetWare 4.1 chart should be based on a 1-to-11, not a 1-to-5 scale.

The chart for "Unix users gain high-speed host link" [CW, Feb. 13] incorrectly listed the pricing for IBM's Thin Node product for the Unix-based IBM SP/2 parallel server line. The correct pricing is $138,000 for an entry-level two-node system and $500,000 for a typically configured eight-node system.

Hitch A Ride To Second-Generation Client/Server On CA-OpenROAD.™





Paint your applications with CA-OpenROAD's visual development tools.

UNIX/Motif version of CA-OpenROAD Customer Order Application.

The path to second-generation client/server has finally been cleared. Introducing CA-OpenROAD.™

With its advanced, powerful, repository-based architecture, applications can be constructed accurately and with ease. And with its multi-platform GUI support, it doesn't matter whether you're targeting UNIX/Motif or Windows.



And since CA-OpenROAD is the only product of its kind that supports triggers and stored procedures with identical source code across databases, you don't have to be a database expert to use it.

What's more, CA-OpenROAD provides both template-driven application generation and complete object-orientation including encapsulation, inheritance and polymorphism.

Mission-Critical
Native Database Access
Object-Oriented
Fully Scalable
Template-Driven
Repository-Based
Multi-Platform

CA World '95
July 16-21, 1995
New Orleans.
Call 1-800-CA-INFO95
for information.

For More Information, Call 1-800-225-5224, Dept. 13102.

So phone today to arrange a demonstration of new CA-OpenROAD. It's a test-drive you'll find truly exhilarating.

New CA-OpenROAD

COMPUTER ASSOCIATES
Software superior by design.

© 1994 Computer Associates International, Inc., Islandia, NY 11788-7000. All products referenced herein are trademarks of their respective companies.

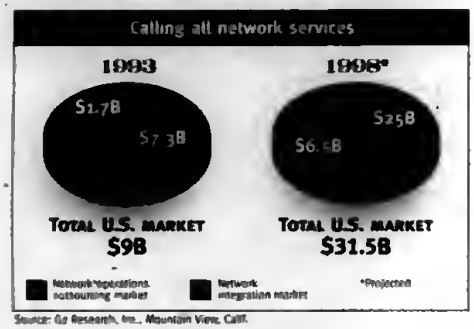
AT&T recasts outsourcing

By Ellis Booker

Eager for a bigger share of the booming networking consulting and services market, AT&T Corp. last week launched AT&T Solutions, a business unit targeting top corporate accounts with complex networks.

Other AT&T companies are already in the outsourcing business — notably AT&T Global Information Solutions, AT&T Business Communications Systems and AT&T Network Systems.

But until now "there wasn't a business unit that had the authority to coordinate, facilitate or draft other AT&T units," said Mark Hodges, a vice president at G2 Research, Inc. in Mountain View, Calif. The lack of such an umbrella organization made complex outsourcing deals "an unwieldy process" for customers, Hodges said.



Source: G2 Research, Inc., Mountain View, Calif.

If AT&T believes in the primacy of network-centric applications, so do some of its largest customers. "Companies that have that ability are going to be at an advantage," said Craig Goldman, chief information officer at The Chase Manhattan Bank NA in New York. "AT&T is well positioned for that," he added.

Ten months ago, Chase turned over its global network operations to AT&T under a multiyear contract. The value of the deal has not been disclosed, but AT&T sources indicated the contract was less than $500 million.

AT&T Solutions will draw on all of AT&T's considerable resources, including AT&T Bell Laboratories, company executives said last week.

Other AT&T units will continue their own outsourcing work, as AT&T Solutions will target only complex, multidimensional deals, executives said.

To ensure cross-unit coordination, AT&T is already implementing a common set of consulting methods and certifications, company officials said.

Underscoring the high profile of the new AT&T unit is its executive management team, which has been culled from the leading lights of the outsourcing industry.

Topping the list is Victor E. Millar, who was introduced last week as president and chief executive officer of the new unit. Millar most recently was president of Unisys Corp.'s Worldwide Information Services, where he was in charge of building the company's services organization (see box at right).

Among those reporting to Millar will be Charles Ansley, vice president of client services and marketing. Ansley joined AT&T last October after a 20-year career at IBM, where his last assignment was as global marketing strategist for IBM's Integrated Systems Solutions Corp. (ISSC).

Rivals in the wings

But AT&T Solutions faces competitors such as General Motors Corp.'s Electronic Data Systems Corp. and ISSC, which have also been pushing network-centric consulting and services.

"IBM just recently reorganized ISSC around global networking, and EDS has been trying for three years to find a strategic partner" for this capability, said Susan Scrupski, editor of "InfoServer," an outsourcing newsletter in Barnegat, N.J.

Although Scrupski said she does not believe AT&T's new unit will have trouble coordinating with other parts at AT&T, more problematic may be its relations with IBM, EDS and Computer Sciences Corp. — all major customers as well as partners with AT&T on outsourcing contracts. "Absolutely, it'll cause bad blood," Scrupski said.

As part of its announcement last week, AT&T Solutions introduced its latest account: Great Western Bank in Los Angeles, the nation's second-largest thrift. AT&T will build a nationwide frame-relay network for Great Western's retail and lending offices in 23 states. Under the $160 million, seven-year contract, AT&T will manage the network, which replaces the bank's private wide-area network.

At least one network manager last week said he would be reluctant to entrust his network to a brand-new unit, even one with AT&T's pedigree.

"The heart of my business is networking, and entrusting [it] to someone else is [a] major issue," said M. Lewis Temares, vice president and CIO at the University of Miami in Coral Gables, Fla.

Millar switches teams

In the past two years, Victor Millar has built the services business unit at Unisys into a fast-growing, $2 billion enterprise that will continue its momentum now that he has moved on to AT&T, analysts said last week.

"He did well at Unisys," said Mark Hodges, a vice president at G2 Research in Mountain View, Calif. "He established them as a credible supplier."

Unisys' Worldwide Information Services group today accounts for 27% of total Unisys revenue, compared with 17% when Millar took it over.

Prior to his stint at Unisys, Millar was chairman and CEO at Great Britain's Saatchi and Saatchi Co., which he joined in 1986 after nearly two decades at Andersen Consulting in Chicago.

Tom Willmott, vice president at Aberdeen Group in Boston, said the services business unit has been "enormously successful for Unisys" and Millar's contribution will be missed. But he said the unit can probably keep up its head of steam.

The team that Millar recruited from other consulting companies has enough talent to carry the ball, said William J. Milton Jr., an analyst at Brown Brothers Harriman & Co. in New York.

There had been speculation that Millar left Unisys because he was frustrated with a lack of support from top management, but Unisys Chairman and CEO James A. Unruh hotly denied that in a meeting with analysts last week.

Millar will be replaced by co-presidents James R. Corey and Edward J. Sanderson, both of whom Millar recruited from McKinsey & Co. last year.

According to Stephen A. Carns, president of Unisys' Information Services and Systems group, Millar's group had a 24% increase in revenue last year.

—Neal Weinberg

Web users cruising for info, not purchases

By Ellis Booker

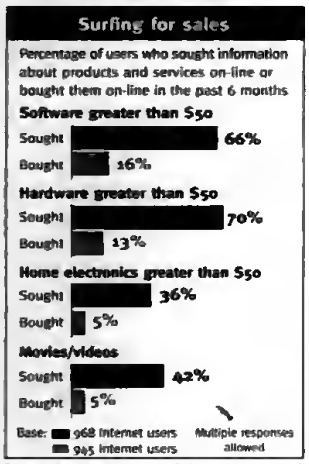
● Now it is a fact: The vast majority of people cruising the World-Wide Web are looking for information, not things to buy.

That is one of the key conclusions of the largest empirical study to date of Web users and their preferences. It is now being analyzed by the University of Michigan Business School.

The Hermes project, which was conducted last October and November, involved nine on-line surveys. The number of participants on each ranged from 989 to 3,522.

Hermes — no relation to the Microsoft Corp. server product of the same name — turned up the following findings:

- Even under the categories of computer hardware and software, only 15% of respondents said they had bought anything on-line.
- On-line buying as a medium trails retail stores and direct-mail channels.
- Only 18% of respondents spent more than $50 on on-line purchases in the previous six months.
- Four to five times as many people use the Web to look for information than to buy goods.



Source: Hermes project, University of Michigan Business School, Ann Arbor, Mich.

Future possibilities

Yet other evidence points to the potential of the Web as a marketing and sales channel, contended Sunil Gupta, the Michigan Business School professor heading the project.

"Commercial Web sites are currently below direct mail [for making buying decisions]. But when we asked what they'd use in six months, they said they'll use the Web more," he said.

Another key finding, Gupta added, is that cybersurfers like and trust the information they gather from both commercial and noncommercial Web sites.

This means Web sites are "high-involvement" settings where vendors can communicate with customers and where a customer's decision-making can be influenced, he said.

Finally, the Hermes results show that cybersurfers are generally not seeking discounts on products. Rather, when asked what the most desirable characteristic was for a Web site, respondents gave the highest score to "good quality information."

Gupta said he intends to launch a larger, follow-up study to Hermes in April. He has also begun collecting data from a list of corporate Web sites. He hopes to increase this corporate panel, now consisting of 165 companies, to 500 sites.

Hermes project details, including raw data and charts, are available at http://www.umich.edu/sgupta/hermes.htm.

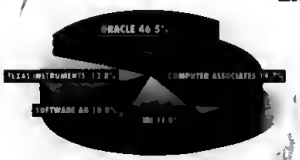
"ORACLE CDE STOOD HEAD AND SHOULDERS ABOVE THE REST."

Larry Gabriel
VP IS
Toys 'R' Us Inc.

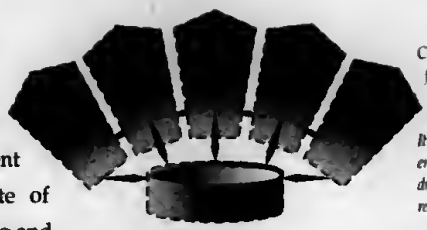


WHY THIS LEADING RETAILER CHOSE ORACLE CDE FOR WORLDWIDE APPLICATIONS DEVELOPMENT.

After real world testing of all the major competitors, Toys 'R' Us chose Oracle Cooperative Development Environment (CDE) suite of tools, Oracle Consulting and Oracle Support to help build in-store and back office systems for the worldwide chain. "Oracle's flexibility will dramatically shrink our implementation time and costs for new customer service, distribution, and corporate office mission critical-applications," comments Ms. Gabriel. For the CDE Technology and Executive Brochures that provide a complete overview of CDE products, call **1-800-633-1071, Ext. 8167.**



*Oracle sells more tools than any independent software company.**



CDE's open, integrated solution for enterprise-wide client/server applications development covers the entire development cycle. It includes CASE, 4GL, 3GL and enduser tools in a repository-driven modular approach to reducing development time.

©1994 Oracle Corp. *Source: IDC–Ranking of top 5 worldwide revenues for ISV 4GL and CASE vendors.

ORACLE

Tandem rises above with Himalaya

There's been a quiet makeover at a mainframe-style company that two years ago appeared to be hitting the skids.

Tandem Computers, founded in 1974, is the leading supplier of fault-tolerant systems and is now a purveyor of open parallel systems in the form of its Himalaya series processors. Although the emphasis is now on parallel systems, the Himalaya happens to be a continuously available design. When these redundant processors are teamed with Tandem's NonStop SQL database management system, you have a combination that few can rival for reliability — and maturity.

Two years ago, Tandem underwent a face-lift. It stopped depending on its own chip designs and adopted Mips Technologies' microprocessors for the Himalaya. This eliminated a huge expense and shifted the need for progressive chip advances to a leading RISC designer. (Mips is now a subsidiary of Silicon Graphics.)

At the same time, it took its NonStop SQL transaction processing DBMS, which already had a number of parallel features, and extended it for use on massively parallel machines. Because fault-tolerant computer designs keep processors and memory distributed across at least two distinct systems rather than pooling memory for a group of processors, NonStop SQL was inherently distributed and parallel from the time it came out in 1987.



With Himalaya, Tandem stepped out from behind the protective curtain of the fault-tolerant label.

Charles Babcock

Tandem has enhanced its features to offer NonStop SQL/MP, or massively parallel processing. One of the keys to parallel database operation is the skill with which its optimizer analyzes a query for parallel execution. The NonStop SQL/MP optimizer doesn't select the best sequential execution plan first and then make it parallel the way some relational DBMS optimizers do. It creates what it detects as the best parallel plan as a first step, says Michael Burwen, a principal at Superperformance Computing Service in Mountain View, Calif.

Needless to say, NonStop SQL retained its on-line transaction processing characteristics. The database engine remains available and running while data is loaded and indexes are created or purged.

"This is the best SQL implementation around at this moment," says Jim Gray, a visiting fellow at the University of California at Berkeley who frequently writes about parallel database issues. The original NonStop SQL "is long in the tooth. It's been in the field for over five years with good operational features."

With Himalaya, Tandem also stepped out from behind the protective curtain of the fault-tolerant label, which formerly commanded a premium price. A two-processor Himalaya K20000 is priced at $339,000, and an entry-level K2000, which will be available next month, is priced at $135,000. These prices represent 35% to 45% reductions per year for the past two years over the previous Tandem product lines even though no fault-tolerant qualities have been sacrificed.

Because of the price cuts, Himalaya unit sales are double those of predecessor models, and Tandem's profitability has also nearly doubled. Earnings per share increased from 16 cents in the fourth quarter of 1992 to 30 cents in last year's fourth quarter.

At the same time, Tandem has been moving beyond its traditional on-line transaction processing approach and moving into decision-support systems. Ameritech, the regional Bell operating company in Chicago, uses Tandem systems for its Customer Usage Tracking System to analyze calling patterns among its 12 million customers.

"Tandem is a good story," agrees Christopher Willard, parallel and supercomputer analyst at International Data Corp. in Mountain View, Calif. "It's offering a parallel system with a lot of attention to availability."

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

News Shorts

Management costs to rise after Windows 95 ships, then fall

In the face of ever-rising costs to manage PCs enterprisewide, two studies surfaced last week with the surprising news that the tide may turn. The catalyst behind this change is **Microsoft Corp.**'s Windows 95, according to reports released separately by International Data Corp. (IDC) in Framingham, Mass., and Forrester Research, Inc. in Cambridge, Mass. Both studies examined user costs and the impact Windows 95 will have on desktop support, management and training costs. The reports predict that desktop management costs will spike up in the initial phase of Windows 95 implementation but then start to drop a year after the operating system ships. By the end of next year, IDC anticipates users spending more than $400 million for outside training and support for Windows 95 migration. Yet that cost mounts to the $1 billion mark once internal support and end-user training are factored into the equation.

Apple offers logo deal

Apple Computer, Inc. last week told developers using Microsoft's Video for Windows that it will not sue them, provided the developers attach an Apple label to their final product that says it "uses Apple multimedia technology." The action comes in the wake of Apple's lawsuit against **Microsoft** and **Intel Corp.** for allegedly using code from Apple's QuickTime video software in Video for Windows. Apple is also suing **San Francisco Canyon Co.**, co-developers with Apple of QuickTime for Windows, saying Canyon provided the code to Intel and Microsoft.

EC reacts to antitrust ruling

The **European Commission** has not decided whether to reopen its antitrust case against Microsoft following the U.S. District Court's decision to reject the settlement between Microsoft and the U.S. Department of Justice. In July, Microsoft agreed to end restrictive licensing practices throughout the European Economic Area in an out-of-court settlement. The two cases cover similar ground and are legally separate, although the parties involved did cooperate.

When you care enough to revamp

Hallmark Cards, Inc. recently named two new information systems directors as part of an overall IS reorganization. Susan Chambers is now director of IS for retail development at the Kansas City, Mo., greeting card manufacturer. Andy Clippard, also a director now, will provide technology services to the product development, strategy/marketing and emerging brands and channel divisions.



Santa Cruz unveils 'net software

The Santa Cruz Operation's IXI subsidiary last week announced IXI Panorama, a Unix desktop environment with a Mosaic interface that links to the Internet. The desktop, intended for use by commercial Unix users such as financial traders at large banks and financial institutions, is priced at $179.

HP, NEC add Pentium PCs

Hewlett-Packard Co. and **NEC Technologies, Inc.** last week introduced high-end Pentium-based additions to their corporate lines. HP's dual-processor-capable Vectra XU 5/100C PC incorporates Peripheral Component Interconnect technology and is based on the 100-MHz Pentium processor from Intel. Pricing will be available in March when the system ships. NEC, meanwhile, expanded its Image P series by announcing 90-MHz and 100-MHz versions, including a top-of-the-line dual-processor-enabled mini tower model. Prices start at $4,199 for a 100-MHz Pentium-based system.



Gupta upgrades database

Gupta Corp. in Menlo Park, Calif., unveiled a major upgrade of its database last week, along with improved management utilities. New features in SQLBase 6.0, due to ship next month, include two-phase commit, triggers and remote monitoring capabilities. Gupta also announced runtime copies of SQLBase priced at $99 each and SQLBase Ranger, a $395 desktop or laptop reporting aid for finding and moving data stored in server databases.

ATM spec clears first hurdle

Last week, the 25M bit/sec. Asynchronous Transfer Mode (ATM) transport specification jumped its first hurdle on its way to ratification as a standard. The ATM Forum's Physical Layer Working Group voted to adopt the Desktop ATM25 Alliance's 25.6M bit/sec. specification as the standard method for lower-speed ATM transmission. A straw vote for technical clarification of the specification will take place in April, followed by a final vote.

Platinum on acquisition trail

Platinum Technology, Inc. has acquired **BrownStone Solutions, Inc.**, a New York developer of repository and data warehousing software. The deal, scheduled to be formally announced this week, continues a string of acquisitions by Platinum as it moves to put together a distributed systems management framework covering both MVS and Unix systems. Platinum, in Oakbrook Terrace, Ill., plans to use BrownStone's technology to develop an object repository for storing data on application and business processes.



SHORT TAKES **Allstate Insurance Co.** has named company veteran Frank W. Pollard to the post of senior vice president of information technologies. . . . **Nokia Group**, a Finnish telecommunications company, invested $7.5 million in **Geoworks, Inc.**, which makes Geos, an operating system targeted at personal digital assistants and set-top boxes.



INTRODUCING THE LATEST ADDITION TO THE ORACLE7 FAMILY: SMALLER ON THE OUTSIDE. JUST AS SMART ON THE INSIDE.

Personal Oracle7™ for Windows gives you all the mental fire power of Oracle7™ in a convenient, inexpensive, standalone package that's fully integrated with the Windows* environment. Imagine. All your favorite Windows tools *and* the industry's leading database sitting on one machine (even a laptop!). And because this *is* Oracle7 we're talking about, your application will be infinitely scalable, and wide open to 92 computing platforms.

Oracle Workgroup 2000™
Proof that you can

IT'S A DEVELOPER'S DELIGHT:
Personal Oracle7 for Windows comes with **Oracle Objects for OLE** which delivers high-performance Oracle7 data access without the complexity of native database APIs or the overhead of external data drivers. Using OLE 2 technology, it provides the simplest and most powerful way for C++, Microsoft's Visual Basic, and OLE 2.0 scripting enabled applications to access Oracle7 data.

To learn more about Personal Oracle7, attend a "Proof that you can" Client/Server Forum. Make your reservations today by calling 1-800-633-1071, ext. 8145 and ask about our other 12 seminar locations.

ORACLE

©1995 Oracle Corp * Runs on Windows 3.1. Personal Oracle7 and Oracle7 are trademarks of Oracle Corp.

IBM sticks with Unix on OS/2 strategy

By Jean S. Bozman

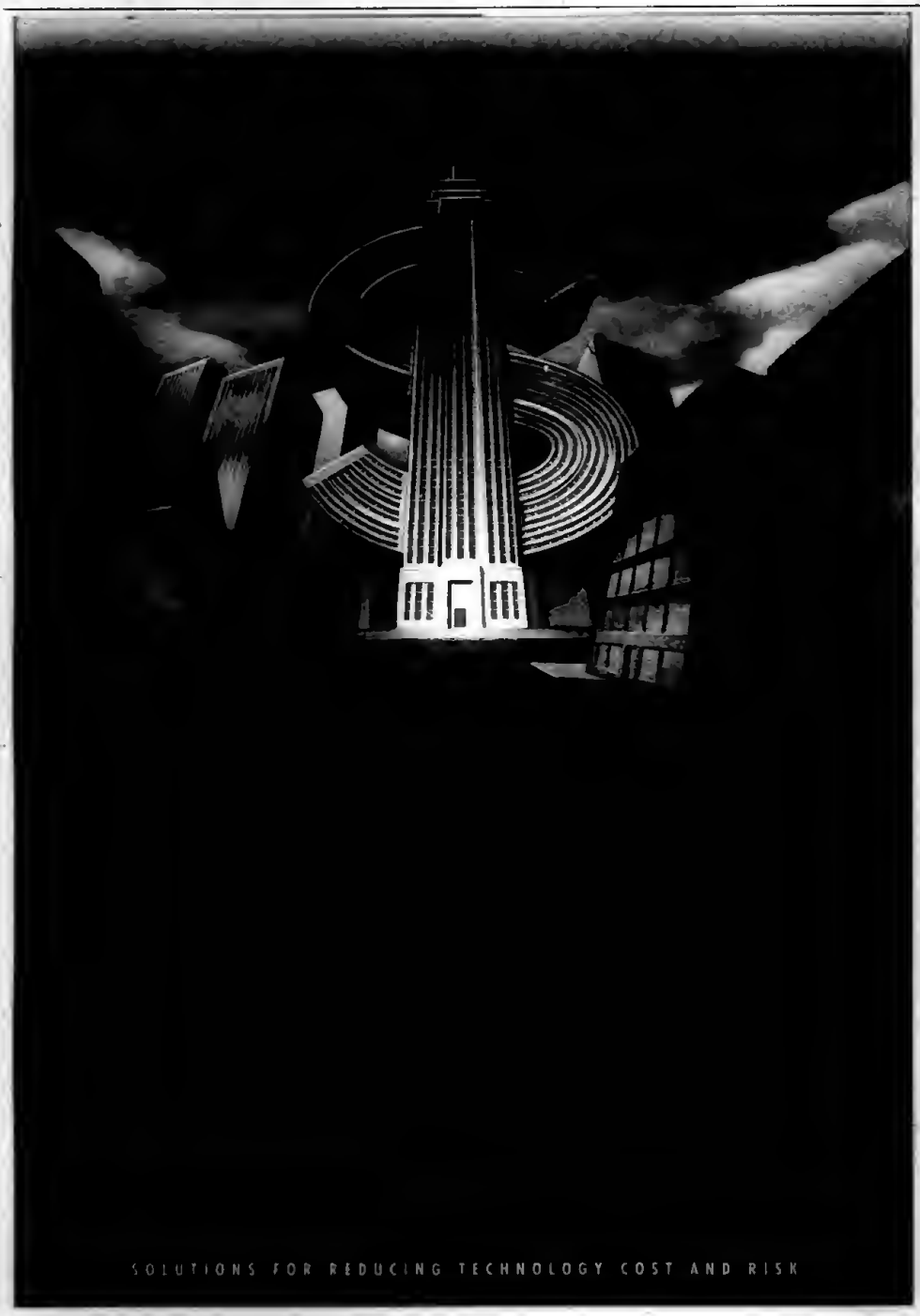
IBM is still pursuing its plan to put a Unix interface on top of its OS/2 operating system, company officials confirmed last week. Users will be able to run Unix applications from the OS/2 PowerPC platform using Unix-standard application programming interfaces (API).

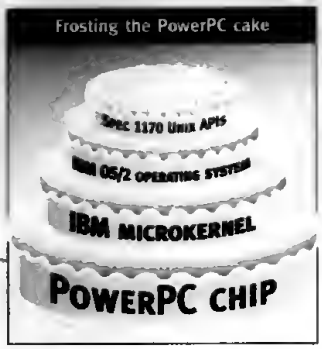
The move expands upon an earlier statement by IBM that it would not bring out multiple personalities on top of a common microkernel-based operating system all at once [CW, Jan 9]. At that time, IBM had said it would deliver just the OS/2 personality on the microkernel by midyear and would later deliver other personalities in future operating systems.

Last week, IBM said it "does intend to enable OS/2 for PowerPC users to have access to popular industry-standard Unix APIs," such as those from X/Open Co., the single-Unix specification (Spec 1170), the X Window System and selected AIX APIs.

In the end, however, it may act more like a Posix interface that allows proprietary operating systems such as IBM's MVS to run some Unix applications, analysts said.

Jeff Mason, vice president of worldwide marketing for IBM's RS/6000 division, said earlier this month that the firm's Unix-on-a-microkernel concept began in IBM's WorkPlace technology plan but has since been modified. An AIX-on-Intel microkernel plan was dropped last year, some analysts said. But IBM has said it is using microkernel technology to move OS/2 from Intel Corp. to PowerPC processors.





Users ambivalent

OS/2 users seemed more bewildered than impressed by the prospect of Unix-on-OS/2. "Usually, the people here are [using] entirely OS/2 or entirely Unix," said one information systems manager at a Midwestern insurance company. "It's really not a blend of the two."

Another IS executive, who also requested anonymity, said, "Presumably, this means that if I'm a Unix developer, I can run my Unix and my OS/2 applications together. Is that something people worry about today? Not yet."

OS/2 is a multitasking desktop system that IBM claims has more than 7 million copies worldwide and about 2,500 desktop and server applications. But as a server for business applications, OS/2 faces a blizzard of competition from Microsoft Corp.'s Windows NT, Unix and Novell, Inc.'s NetWare, analysts said.

"Anything they can do to get more applications running on OS/2 today would be a big boost to the success of the environment," said Tony Iams, a research analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y. "This is strictly support for source code compatibility. You will be able to recompile Unix applications for OS/2." That could include Unix operating systems other than IBM's AIX, he said.

Dan Kuznetsky, an analyst at International Data Corp. in Framingham, Mass., said there are few OS/2 server applications compared with the number of server packages on various Unix platforms.

Micro Focus® Dialog System™

Life has its share of adventures. Does building a GUI have to be one of them?

Putting a Graphical User Interface onto your new client/server and COBOL applications can be simple, easy, and dare we say, fun. The new Dialog System from Micro Focus is industrial strength, scalable and optimized for COBOL programmers. Unlike departmental solutions, it can support your most important, enterprise wide business applications. With Dialog System, building a GUI can be as easy as the point and click of your mouse. No difficult training. No API calls. You can quickly prototype, test and refine your GUI. When you're finished tweaking, the prototype becomes the production interface. You can even make on-the-fly modifications (after your interface has been put into production) without changing the business logic of your system. That same interface can run on all the popular desktop operating environments without changes, because Dialog System GUIs are portable. Dialog System is the Big GUI Kahuna because it's the most powerful way to create a Graphical User Interface without exposing yourself or your code to the pain of making the wrong move.



See for yourself. Contact Micro Focus at 800 MF COBOL Ext. 1204 and ask for your copy of the Micro Focus CD. On it, you'll find descriptions and interactive demonstrations of Micro Focus Development Tools.



A better way of programming™ **MICRO FOCUS®**

Micro Focus is a registered trademark and "A better way of programming" and Dialog System are trademarks of Micro Focus Ltd.

Data warehousing

Complexity rising on data access front

By Rosemary Cafasso
ORLANDO

Although the industry has been talking up data warehousing for a long time, many users are still uncertain how to proceed with this information delivery strategy.

"It's a lot more complex than I thought it could possibly be," said Kelly Flynn, a technology specialist at Flint Ink Corp. in Detroit, which hopes to set up a warehouse on an IBM AS/400.

Flynn and other attendees at the Data Warehousing Conference here last week said they believe warehousing can finally deliver the data access that end users have long demanded. But they also said it is difficult to pull together because it involves so many pieces.

What is your current deployment of data warehousing?

- Planning – 28%
- Piloting – 29%
- Modifying – 13%
- Enterprisewide – 7%
- Multiple warehouses – 7%
- None – 4%

Base: 400 IS professionals at Fortune 1,000 companies (not all categories listed)

Source: The Spiral Group, Bedford, N.H.

Warehousing is an old mainframe concept now enjoying a rebirth with the movement to client/server computing. In short, warehousing calls for pulling data out of production systems and creating databases, or warehouses, that are dedicated to end-user queries.

"It does seem that within 18 to 24 months, data warehousing has exploded," said Frank McGuff, a director of Braun Technology Group, a decision-support and data warehousing consulting group in Chicago. "The bad news is users have expectations and misconceptions of the simplicity of the task."

The problem, users noted, is that warehousing requires so many decisions — ranging from the selection of a hardware platform, database and access tools to the management of end-user queries and the warehouse. In addition, users need to pick tools for replication, data extraction, updates and security.

Users must also decide how to maintain meta data — or data about the warehouse — and whether a company would be best served by a centralized warehouse or several small warehouses.

"We didn't do it a little piece at a time, and now we are going back and doing it by chunks," said one project leader from a West Coast communications company, who requested anonymity. The biggest challenges are figuring out the amount and type of data to load into a warehouse, he said.

Start small

While analysts agreed that many warehousing issues need to be addressed, they also said users should keep a narrow focus on their warehousing efforts. They recommended completing a small project instead of trying to make all the warehousing decisions at once.

"We say focus first on a core warehouse and then figure out how to distribute it to users," said Ken Orr, president of The Ken Orr Institute in Topeka, Kan., in a presentation at the warehousing conference.

Even so, users said the task is still not easy. Michael Vetrano, a database administrator at Avis, Inc. in Garden City, N.Y., said Avis is completing a warehousing prototype on a Sybase, Inc. database management system of about 5G bytes. While the prototype is going well, the company must now make several basic decisions about the final production warehouse platform and end-user data access tools.

OLAP: Who needs it?

Users grapple with impact of expensive, support-heavy on-line analytical processing

By Rosemary Cafasso
ORLANDO

To OLAP or not to OLAP?

That question hounded many users at the Data Warehousing Conference here last week as they weighed the benefits and drawbacks of OLAP, or on-line analytical processing.

Take David Scott, manager of applications at Carolina Power & Light Co. in Raleigh, N.C., and an attendee at a one-day OLAP Forum that was part of the warehousing conference. Scott is evaluating various OLAP offerings, and while it appears the tools are easier to use than many SQL query tools, he questioned, "How many dimensions do we really need?"

Scott was referring to an OLAP tool's ability to present multiple cuts or dimensions of data.

The emerging OLAP field includes multidimensional databases and access tools as well as other decision-support technologies. OLAP tools are attracting more attention lately as alternative data storage and access products to the traditional SQL environment because many of them have been fine-tuned for complex ad hoc queries. The multidimensional capabilities, for example, allow users to look at data from many different perspectives.

Complicated decision

But selecting an OLAP product is far from easy, users said. For starters, some users are not sure their data warehousing strategies really need these tools. Also, OLAP tools may be easier to use than some SQL tools, but they will still mean yet another technology for information systems departments to support.

"Right now, we are support-strapped," said David Tanaka, a decision-support systems manager at Hospital Health Plan Management Corp. in Minneapolis. "If we introduce something like OLAP, we will have to give it a lot of support."

Also, an OLAP commitment will not be cheap. Prices range from the $1,000-per-user price for CrossTarget from Dimensional Insight, Inc. to nearly $100,000 for a full suite of database, applications and development and access tools from Pilot Software, Inc.

Yet, like many users, Tanaka said discounting the need for OLAP tools may not make sense, either. His company is taking at least two approaches to get at data, and both are too slow, he said.

One approach involves downloading data from various databases to a Watcom database — from the Powersoft subsidiary of Sybase, Inc. — so users can analyze data from the desktop. The company is also using Microsoft Corp. Open Database Connectivity gateways to reach data in a variety of databases.

Many OLAP products could come in handy for warehousing, analysts said. OLAP databases, for example, store data in cells in multiple layers or dimensions in the database, instead of in the traditional rows and columns of a relational system. Typically, these layers would provide more detail on a particular category of data.

Relational systems, on the other hand, have been fine-tuned for volume processing and can bog down during complex queries.

Unlike many SQL query tools that require some understanding of SQL, OLAP access tools typically use a spreadsheet metaphor and give options such as drill-down or "slice-and-dice" data.

"There are certain problems with SQL front ends — you can't easily build in intelligence or do dynamic analysis," said Nicholas Galemmo, a senior systems analyst for decision-support systems at HealthNet in Woodland Hills, Calif. "We are hoping that's what OLAP will provide."

NetWare 4.1 support builds

By Laura DiDio
BOSTON

In a move that Novell, Inc. claimed underscores growing developer support for NetWare 4.1, two third-party suppliers last week unveiled software optimized for the new environment at Network Expo 95.

At the same time, Novell announced that its NetWare 4.1 Software Developer's Kit Special Edition, which costs less than $50 and incorporates a two-user version of NetWare 4.1, is now shipping in volume. Novell has shipped alpha and beta releases of the NetWare 4.1 kit since last May. However, these earlier packages did not contain a free two-user version of the 4.1 network operating system.

Cheyenne Communications, Inc. in Roslyn Heights, N.Y., introduced its Faxserve 3.0 software, and Legato Systems, Inc. in Palo Alto, Calif., rolled out NetWorker 3.1 for NetWare, a network storage management software program that automates network backup procedures.

Both products are among the first to directly use the distributed NetWare Directory Services (NDS) component of the new network operating system, according to Scott Wells, Novell's senior manager of NetWare Developer Programs.

NetWare special
The NetWare 4.1 Software Developer's Kit Special Edition includes everything for developers to create full client/server applications.

Faxserve 3.0, for example, enables users to send and receive fax documents from their desktops through Windows, MS-DOS, electronic-mail packages and other software applications that support fax integration, Wells said.

Using NDS, Faxserve 3.0 adds fax server objects to the directory. This means users no longer have to log in separately for fax servers or attach to different servers to access fax capabilities, Wells said. Faxserve 3.0 also eliminates the need for network administrators to install separate fax management software packages.

Similarly, Legato's NetWorker 3.1 network storage management software relies on NetWare 4.1's NDS to ensure automated systems backup across the entire enterprise, according to Wells.

Bob Sakakeeny, an analyst at Aberdeen Group in Boston, said he viewed the latest NetWare 4.1-compatible announcements positively but noted that they are incremental steps. He said mid-size users who constitute the bulk of the NetWare 3.x installed base are content with the product and more than pleased with its performance.

"Users who have massive NetWare 3.x installations are telling us they're in no hurry to migrate because they haven't maxed out the capabilities of 3.x, and they're still reticent about NetWare 4.1 because it's still new and relatively unproven," Sakakeeny said.

"The availability of applications and the 4.1 [developer's kit] will assure them of third-party support for the new [network operating system], but it won't cause them to stampede to the nearest reseller and buy it right away," he added.



A new, more effective approach to distributed computing is now a reality: *server/client* computing. And the company that can deliver it to you is *USoft—The Server/Client Software Company.*

Server/client is a top-down, enterprise-wide approach for integrating the power of distributed servers with the ease and appeal of graphical, intelligent client platforms. The unique strength of *server/client* is its ability to let you rapidly generate complete business applications–from the server out–that are responsive to changing business conditions. Plus, *server/client* is transparent to your organization–supporting all popular hardware and software platforms.

USoft delivers software tools to plan, build and manage this *server/client* approach across your enterprise. USoft is an innovative, independent new Unisys company. It begins life with all the strengths needed to deliver a level of application development productivity and flexibility not possible with today's client/server software.

One important strength comes from the Unisys acquisition of TopSystems, Inc.–a European company with a proven repntation for powerful, object-oriented application development tools. TopSystems' server-focused products are already running in over 250 enterprises.

The USoft story is just beginning. Look for a growing suite of impressive new software geared to enterprises that demand scalable, *server/client* solutions. For your free copy of the white paper entitled "Server/Client Computing: Turning The World Right Side Up," call 1-800-For-USoft or e-mail info@usoft.com. And help ns celebrate an arrival we've all been waiting for.

UNISYS

© 1996 Unisys Corporation.

Compaq pitches PC management initiative

By Jaikumar Vijayan and Steve Moore

Impatient with the progress of efforts to develop a PC management standard, Compaq Computer Corp. last week outlined its own desktop management initiative. Some saw the move as an attempt to leapfrog the standards process and get a leg up on the competition.

Specifically, Compaq unveiled its Intelligent Manageability strategy, which will reportedly make it easier for users and network administrators to inventory, troubleshoot and protect PCs in a networked environment. Compliant products are expected out by year's end.

Possible dichotomy

The initiative sparked some concern because the Houston company appears to be splitting from the Desktop Management Task Force's (DMTF) standards effort to create its own standards. But Compaq said its standards will be fully compliant with the DMTF's Desktop Management Interface (DMI) in the long term.

Still, last week, the company dismissed DMI as "not yet ready for widespread [network] deployment" and light on functionality. There are DMI-compliant products on the market now from companies such as Digital Equipment Corp., Hewlett-Packard Co., Intel Corp., NEC Technologies, Inc. and several other vendors.

Though Compaq is a member of the DMTF's steering committee, the maverick company has lined up nine vendors to participate in its Compaq Desktop Management Solutions Partner Program. They include Intel, Cheyenne Software, Inc., McAfee Associates, Inc., Novell, Inc., Symantec Corp. and Tally Systems Corp. These companies will develop and integrate desktop management tools on Compaq hardware.

For example, Tally's NetCensus desktop inventory tool will be able to recognize and gather information from LAN-connected Compaq hardware in greater detail than before.

The partners program will offer users an alternative approach to managing the hardware and software in LAN-attached PCs. However, it is drawing criticism already.

"We've got to start someplace and build on a foundation. If Compaq has been in [DMTF] and agreed to the standard, they should run with it," said Glen Farrell, LAN systems coordinator at Firestone Textiles Co. in Woodstock, Ontario.

Compaq said it will back the DMTF standard in the long term. "We are fully committed to industry standards. We are simply taking tools that exist today with a limited amount of functionality and giving them a lot more functionality," said Andrew Watson, director of desktop marketing at Compaq.

Not everyone was buying that, however. "It seems like what they are trying to do is create a mini-consortium of their own to define another set of desktop management standards," said a spokesman at a PC vendor that expects to have DMI-compliant systems by midyear.

By working with its partners, Compaq expects to sell PCs that have detailed hardware and software information integrated into them; that information could be accessed from any node on a variety of networks. The depth of the information and its easier accessibility will make functions such as asset management and inventory tracking much easier, Watson said.

Some analysts said such an approach would give Compaq an edge as far as implementing desktop management tools is concerned.

"DMI compliance is not going to be a reality until the [operating system] support is there," said Richard Zwetchkenbaum, an analyst at International Data Corp. in Framingham, Mass. "This presents an opportunity for vendors like Compaq to offer a differentiated solution that is compliant with DMI but is a superset of it in terms of features and timing."

A DMTF spokesman said implementations of the DMI service layer are currently available for DOS and Windows 3.1. Microsoft Corp. plans to implement the layer in Windows 95.

New specification

The DMTF last week announced a new Software Management Information Format (MIF) specification. The MIF provides a method for software publishers to communicate version identification and audit dates for their products.

Decree denied

CONTINUED FROM PAGE 1

information officer at a major nonprofit organization in New York.

"I don't think it'll have any impact on our users," said Bill Cornfield, president of New York consultancy The Windows Support Group, Inc., whose clients include the National Football League, Anheuser-Busch Cos. and American Express Corp.'s Gold Card division. "The practical impact will be very small."

"I love all of Microsoft's products so I don't care," said Cheryl Cade, a systems analyst at Pacific Bell in San Francisco. "I can see where people see the need for antitrust action, but I don't think there's anything that can stop [Microsoft]."

Of course, a higher court order upholding Sporkin's action could open a Pandora's box for Microsoft.

For example, if Sporkin's refusal to sign off is upheld, the Justice Department may be more likely to litigate the charges against Microsoft that led to the settlement.

Among other side effects, though not directly related, could be a delay or even the disallowance of Microsoft's proposed acquisition of Intuit Corp., a Menlo Park, Calif., maker of personal financial management software. The uproar may also put pressure on Microsoft to voluntarily or otherwise alter its business practices, much as IBM did after the Justice Department dropped an antitrust suit against it in the 1970s. And it is possible that competitors could step up attacks.

Wheels of justice

But several antitrust experts said the Justice Department and Microsoft have a very good chance of winning their appeal. And if they lose that one, they can appeal all the way to the U.S. Supreme Court, meaning it may be years before the case progresses any further.

In addition, a major reason the Justice Department brought such a narrow consent decree to Sporkin in the first place is because it is excruciatingly difficult to prove anticompetitive practices other than fairly simple ones such as price fixing, much less convince a jury of guilt, said Gerry J. Elman. He is a former attorney at the Justice Department's antitrust division and chief executive officer of Elman Wilf & Fried, a law firm in Media, Pa.

Senior editor Elizabeth Heichler contributed to this report.



The Justice Department appeal

U.S. Assistant Attorney General Anne Bingaman's unit said Judge Sporkin did the following:

1. "Erroneously concluded that the Tunney Act permits a court to review the history of [the] investigation, the government's decision not to challenge particular practices ... and its intentions to challenge uncharged conduct in the future."
2. "Fail[ed] to limit [his] consideration of the antitrust consequences of the [consent] decree to whether the relief ... adequately remedies the violations set forth in the complaint. Indeed, the court condemned the decree because it did not dissipate market power acquired through lawful conduct and ... did not address antitrust concerns not even alleged in the complaint."
3. "Improperly departed from the principle that he must defer to the policy and litigation judgments of the Department of Justice."
4. The Justice Department's record of filing three consent decrees per month "is threatened while Judge Sporkin's ruling stands. Its inevitable effect is to deter parties from entering into consent judgments."

Unorthodox opinions

High on the list of complaints in the government's appeal is that U.S. District Court Judge Stanley Sporkin ignored the fact that judges cannot bring antitrust charges against anyone. That power is held by the Department of Justice.

"The judge doesn't get to rewrite the complaint; he has to take the complaint as given" by the Justice Department, said Joe Sims, an antitrust attorney at Jones, Day, Reavis & Pogue in Washington.

Although Sporkin's decision to throw out the consent decree was not unexpected, it was definitely unorthodox.



Nodding to attorney Gary Reback's filings, Sporkin said the late-breaking "information and arguments submitted are helpful, particularly the submissions received from" Reback's law firm.

That firm, Wilson, Sonsini, Goodrich & Rosati in Palo Alto, Calif., had filed several briefs in a last-ditch effort to derail the government's negotiated antitrust settlement with Microsoft.

Calling the settlement "too little, too late," Sporkin's opinion said the proposed consent decree does not meet the public interest under the Tunney Act (see chart at left), which governs antitrust consent decrees. He argued that the decree is too narrow in scope because it restricts only Windows licensing policies and nondisclosure agreements and still allows Microsoft to make vaporware announcements that freeze the market [CW, Feb. 13].

Sporkin said if he signed the decree, "the message will be that Microsoft is so powerful that neither the market nor the government is capable of dealing with all of its monopolistic practices."

The judge has suggested that the decree should have covered other issues. These include vaporware announcements and allegations of Microsoft leveraging its operating systems dominance to gain unfair advantage in applications.

Anne K. Bingaman, head of the Justice Department's Antitrust Division, said she vigorously objected to Sporkin's efforts to get investigative details, consider new charges and substitute his own notion of an ideal settlement. She said future settlements will be hard to get if the defendant suspects a judge will just reopen the investigation. —*Stuart J. Johnston and Mitch Betts*

Developers laud Delphi

By Elizabeth Heichler
SAN FRANCISCO

Despite the recent financial and managerial uproar at Borland International, Inc., the company remains a strong contender in the war for software developers' hearts and minds. That is, if the enthusiastic reception for last week's launch of its Delphi applications development tool is any indication.

Attendees at the Software Development '95 show at the Moscone Center here crowded Borland's exhibit Tuesday, following the rumor that the company would give away thousands of free copies of the much-heralded product. Delphi was later distributed to the capacity crowd of more than 2,000 developers who sat through the 1½-hour unveiling.

Analysts have pointed recently to Borland's tenuous financial situation as a large disincentive to invest in the company's development tools, but developers at the show seemed unconcerned.

> "I think [Delphi] is one of the most interesting products to come along for client/server"
> Roland Racko
> consultant

"We're very impressed, and we'll buy it when it comes out," said Dennis G. Taylor, manager of manufacturing systems at Rockwell International Corp.'s Collins Avionics & Communications division in Cedar Rapids, Iowa. Three developers in Taylor's group are using a field-test version of Delphi.

"We've used Visual Basic for some time. Delphi is as easy to use and seems to have more power," Taylor said. He added that he liked Delphi's ability to generate executable files. It would be "excellent" for developing factory floor data collection applications, he said.

Put it to the test

Developers said they will evaluate Delphi against client/server tools from Powersoft, a subsidiary of Sybase, Inc.; Gupta Corp.; Oracle Corp.; and Microsoft Corp. Most often cited were Microsoft's Visual Basic and Powersoft's PowerBuilder, against which Delphi has the advantage of using a compiled rather than interpreted language — thus delivering better performance for applications, developers said. They also deemed Delphi a more fully object-oriented environment.

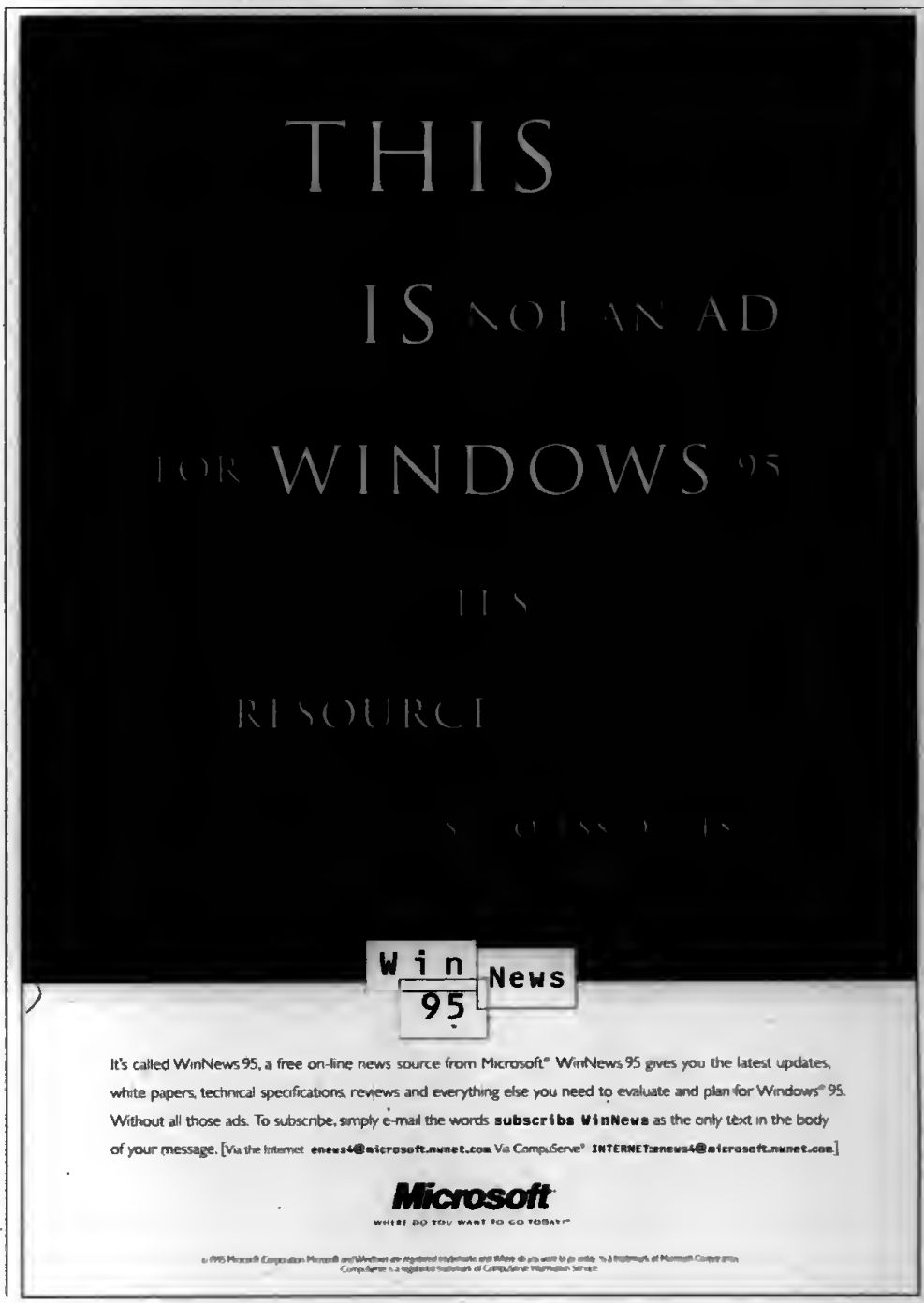
Jonathan Jones, technical lead at Martin Marietta Corp. in Littleton, Colo., plans to put Delphi through its paces to see how it runs against large databases. "I work in the financial reporting area, and we've got 20 million rows in a database," he said. "We're very interested in it. Right now, we'll do anything to help accelerate applications."

However, Jones said he had some reservations about the fact that Delphi is based on Object Pascal. "If it were C-based vs. Pascal, I would be all over it. We're a C and C++ shop," he explained. But he added that enough similarities exist between C and Pascal that it will not be an overwhelming problem.

While developers at Martin Marietta are using tools such as PowerBuilder, Jones said he likes to write at a lower level than many client/server tools permit. "This product lets me get at the code," he explained.

"I think [Delphi] is one of the most interesting products to come along for client/server," said Roland Racko, an independent consultant in New York. Borland's Pascal implementation delivers good applications performance, addressing a major issue for client/server developers who find performance slowed by tools that use interpreted rather than compiled languages, he said.

Among software companies announcing support for Delphi were TurboPower in Colorado Springs, which brought out two component libraries that can be used with Delphi. Each library costs $199 and will be available in the second quarter, according to TurboPower.



Two-chip P6 promises performance in '96

By Jaikumar Vijayan

■ Generational changes are taking place rather rapidly these days at Intel Corp.

The Santa Clara, Calif.-based chip maker last week sketched out details for its next-generation P6 processor, even before the silicon has settled on its Pentium processor family announcement. But products based on the P6 are expected to have a relatively slow ramp-up, not appearing in volume until at least mid-1996 or so, analysts said.

The new 2.9V Intel chip, due to start shipping the second half of this year, will operate at 133 MHz and support data integrity features such as Error Checking and Correction and Fault Analysis and Recovery, according to Intel.

The P6 is expected in the high-end workstation and multiprocessor class of systems, but Intel claimed that sub-$4,000 desktops will be available by year's end.

The P6 maintains the x86 instruction set, which means that all current software and applications running on x86 architecture will be compatible with the P6. However, the processor's multichip design means that systems vendors will have to redesign motherboards to incorporate it. This could also result in a relatively slow availability of systems based on the product.

Unlike standard processors, in reality the P6 is a two-chip module, with an integrated 256K-bit L2 cache physically situated next to the CPU. This design significantly increases the performance of the processor, said Dean McCarron, an analyst at Mercury Research, Inc. in Scottsdale, Ariz.

"The raw performance boost as a result of this feature is likely to be around 70% to 80%," compared with that of current Pentium processors because it eliminates the need for a separate, external L2 cache, McCarron said.

P6: Intel's next generation

- 32-bit architecture
- 256K-bit integrated L2 cache
- Performs at 200 SPECint92 at 133 MHz, twice the performance of Pentium
- Transistors: 5.5 million
- Dynamic Execution microarchitecture (branch prediction, speculative execution)
- 2.9V power supply, 14W typical power dissipation

Performance is further boosted by the incorporation of technology called Dynamic Execution, a big iron technique that rival chip maker Advanced Micro Devices, Inc. has already incorporated into its K5 Pentium-class processors, due to be released around midyear. The technology basically uses techniques such as speculative execution of instructions and advanced branch prediction capabilities to speed up performance.

The initial high cost of the chip will mean that desktop products in the $4,000 range based around the P6 will not be widely available until mid-1996, said Tony Massimini, an analyst at In-Stat Research, Inc. in Scottsdale, Ariz.

Early adopters will most likely put the processors into high-end application servers and workstations and will use Intel's upcoming 120- and 150-MHz Pentium chips in desktops and low-end servers, analysts said.

Intel said it has already sent samples of the chip to vendors.

The multichip design of the P6, however, raises questions about the compatibility of clone processors with Intel's newest processor. Because of the integrated static RAM on the module, the P6's pinouts are very different from those of current processors and will make pin-for-pin compatibility impossible for clone manufacturers.

For the same reason, upgrade paths from Pentium to P6 will not be available for some time after the P6 chip is released because the P6 pinouts are different from the Pentium's, analysts said.

Pin-for-pin compatibility will probably not be possible between Intel's P6 and rival AMD's K5 processor, a spokesman at AMD acknowledged. "The real issue is that this is an x86 architecture. The K5 also uses the x86 instruction set," so all software that runs on the new processor will also run on the K5, the spokesman said.

Chip rivals gear up for Intel's latest

The P6 will represent a significant improvement over current Pentium-based systems, but it will not be the only player by far.

The PowerPC camp is getting ready to fire its own salvos. Apple Computer, Inc., IBM and Motorola, Inc. last week outlined performance targets for processors that outstrip the P6.

For instance, by year's end some versions of the PowerPC 620 family — aimed at the application server and technical workstations market — will achieve an SPECint of 330, compared with a SPECint of 200 for the P6.

SPECint is a benchmark that measures integer performance of the processor. Versions of the PowerPC 604, aimed at medium and high-end commercial applications, will achieve a SPECint of 225.

Companies such as AMD and Cyrix Corp., which are direct rivals of Intel and the Pentium, are also getting set to announce processors.

These offerings will not be quite in the same league as the P6 but will still offer enough gains over current Pentium systems to make them attractive, analysts said. These chips are expected to ship in the second half.

—Jaikumar Vijayan

IBM drops RAID boost

CONTINUED FROM PAGE 1

sons.

IBM's about-face "could change our thinking," said an information systems official at a financial services company in the Midwest that is looking at expanding its Ramac installation. "It just cuts down on the opportunity," said the executive, who asked not to be named.

To appease customers who had been promised a capacity increase, IBM will essentially sell two controllers for the price of one, said Steve Marshall, manager of international sales at IBM's Storage Systems division in San Jose, Calif. "I don't know if 'give' is the right word, but we recognize that the whole package has to be priced to compete with the market."

Nonetheless, upgrading "is going to cost more" than expected, said Paul Wolfstaetter, an analyst at Gartner Group, Inc. in Stamford, Conn. Even if IBM is accommodating on price, "there are a whole bunch of hidden costs" awaiting users, including planning revisions, increased negotiating time and a more disruptive installation and system programming process, he added.

Not done yet

IBM is not completely ending 3990 Model 6 development, said Steve Marshall, manager of international sales at its Storage Systems division. A feature for copying data to remote systems for disaster recovery purposes is still scheduled to be released in June, he said. The feature was originally supposed to ship last year.

Rivals at the ready

The lack of a boost for the 3990 Model 6 will leave IBM at a capacity disadvantage, compared with rivals EMC Corp. and Storage Technology Corp., which can put 500G and 400G bytes, respectively, behind their controllers. That may make it harder for IBM to maintain its dwindling market share lead over EMC, said Carl Greiner, an analyst at Meta Group, Inc. in Stamford, Conn.

"Their strategy obviously has got some holes in it, and they're going to have a tough go of it to 1995 as a result," Greiner said. "I don't see Ramac getting a large acceptance in big data centers until they get a stronger controller."

An all-new controller is under development and should be delivered in the first half of 1996, Marshall confirmed. That device, code-named SeaStar, should eliminate the capacity limitation and allow users to create fault-tolerant Ramac clusters linked by a ring of controllers, sources said.

However, another user, who asked not to be identified, said his storage needs cannot wait for the follow-on controller. The 3990 Model 6 limits are "disappointing" and may make StorageTek's Iceberg 9200 array a more viable short-term option at his shop, he said. "We're reevaluating our RAID decisions now."

IBM has limited its spending on storage development while it tries to improve profits in that area — hence the decision to shift resources away from the 3990 Model 6 to other projects such as SeaStar, Marshall said.

Jekyll and Hyde

Ramac users will see benefits and drawbacks when IBM ships larger disk drives without enabling its 3990 Model 6 controller to support more capacity

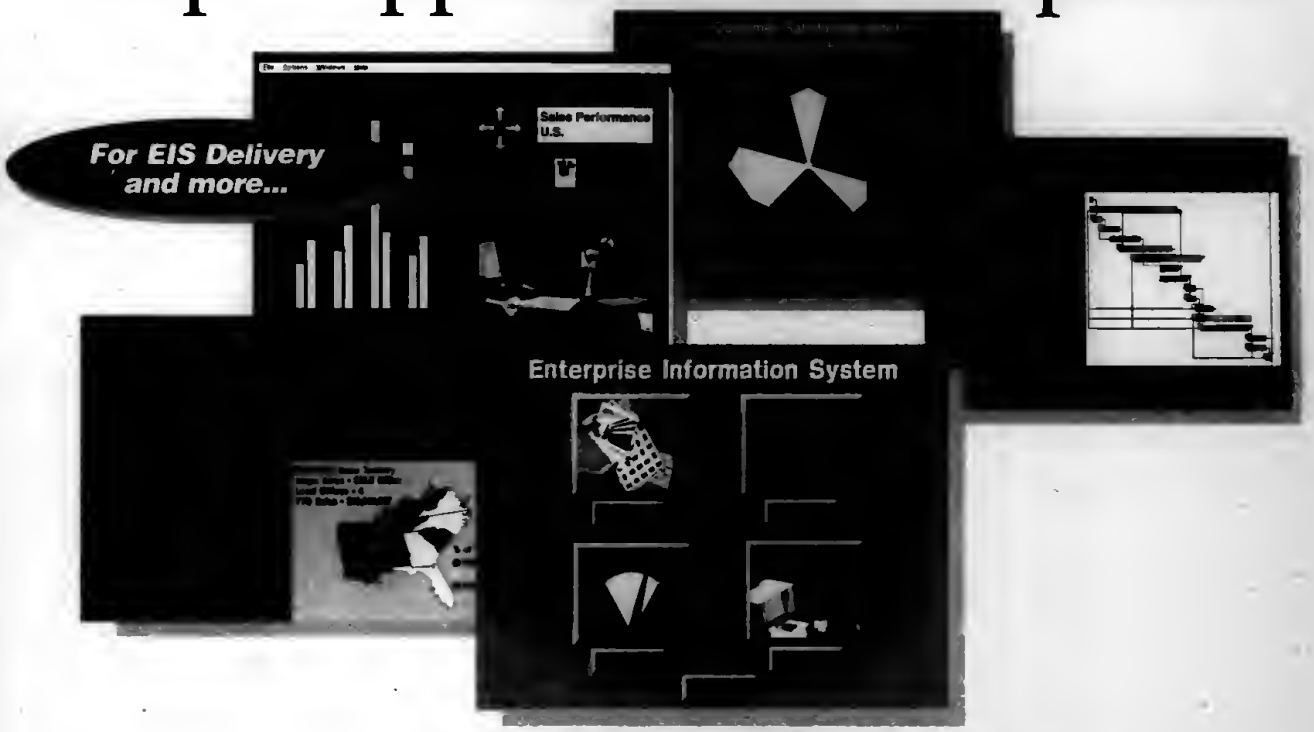
Benefits	Drawbacks
4G-byte disk drives will reduce Ramac footprint compared with existing 2G-byte models	Need for second controller to go beyond 1806 bytes would add to footprint
Better performance because of faster disk drives and multiple controllers	Adding controllers would require more channels and increase power usage
Higher reliability and fewer components to break down	Storage management complexity may increase

The 3990 Model 6 is nearing the end of its life and would have needed "major modifications" to support more capacity, Wolfstaetter said. On the other hand, SeaStar "would definitely be a leg up" on other mainframe RAID vendors if IBM ships it as planned, he added.

SeaStar's ring-based architecture will let users create disk storage pools with multiple controllers that could off-load processing from host systems and back one another up in the event of failures, sources said.

Marshall declined to comment on product details but said expectations for first-half 1996 shipments are "reasonable."

Client/Server Rapid Applications Development



The tough decisions aren't always made at the top. That's why it's important to empower executives and every *other* decision maker with the right information...at the right time. And that's also why the SAS® System is redefining the role of applications development, giving you a complete *enterprise information system* that taps directly into your organization's vast information reservoir.

Bring an Enterprise View to Every Desktop—Executive and Otherwise

With the SAS System, you can build custom-tailored applications in far less time, using fewer resources, than it takes to force-fit an off-the-shelf solution into *your* organization. And because the SAS System has its own built-in strategy for client/server, you can integrate data and applications from different hardware platforms into a single, company-wide information delivery system.

Build applications that incorporate pull-down windows...access to electronic mail...drill down, hotspotting, and exception reporting...and graphical display of critical success factors. Working hand-in-hand with these basics—out of sight but always at the ready—are literally hundreds of powerful, proven tools for virtually every decision support need: financial planning and modeling, corporate reporting, quality improvement, and much more.

Take 30 Days to See, and Decide, for Yourself

Let the SAS System help you reach the right decision about applications development, EIS, and every other issue important to your business. Call us now at **919-677-8200** for a free video preview...plus details about a no-risk software evaluation and upcoming SAS System business briefings.

The SAS System. The World's Leading Information Delivery System.

SAS®

SAS Institute Inc.
Sales and Marketing Division
SAS Campus Drive ☐ Cary, NC 27513
Phone 919-677-8200 ☐ Fax 919-677-8123
In Canada: Phone 1-800-363-8397

SAS is a registered trademark of SAS Institute Inc
Copyright © 1994 by SAS Institute Inc.

City of Palo Alto saved from urban blight.



© 1968 Hewlett-Packard Company All rights reserved. 1968-1



HP SureStore Optical Jukebox gets 48 cabinets of files onto the network and off the floor.

It was not a pretty sight. More than 900 square feet of office space, buried in paper documents. Police records. Building inspection reports. Tens of thousands of files. And with the growing demand for information—and the mounting costs of finding misplaced records—a bad situation was fast becoming a crisis.

HP SureStore

Hewlett-Packard had the long-range solution the city desperately needed. An optical jukebox that could safely store every last file onto the network. Since HP optical disks have a 30-year shelf life, the city's records would last far longer than they ever could on paper. And there'd be no danger of running out of storage space. HP optical disks can be removed and swapped—so storage capacity is virtually limitless.

Today archived documents that took city workers days to unearth can now be accessed with a simple touch of a key. And the savings are substantial. Between increased productivity and reduced overtime, the City of Palo Alto figures their HP SureStore Optical Jukebox saves them about $26,000 annually. And frees up $31,000 worth of rented office space to boot.

Are burgeoning archives a blight on *your* operations? HP has the proven solution. For more information, call **1-800-826-4111, extension 9106.**

HEWLETT® PACKARD

Digital simplification effort hits some snags

By Neal Weinberg

Some Digital Equipment Corp. customers, in the midst of upgrading their software licenses, are finding that the company's 4-month-old simplification program is not so simple after all.

In October, as part of an effort to make it easier to do business with the company, Digital reduced the number of price tiers for VAX licenses from 22 to three and decreased the number of Alpha tiers from six to three.

"They needed to make it simpler," said Tommy McCall, a software engineer at S. E. Huffman Corp. in Clover, S.C. McCall has not gone through the relicensing process, but he said the tier reduction appeared to be an improvement.

However, for some dealers, it is still not simple enough. While noting that the intent of the simplification plan was a good one, they said the devil is in the details, especially when it comes to customers trading in old VAXs.

"It's very confusing," said Michael Andelman, president of Liocs Corp., a value-added reseller in Lombard, Ill.

"One of the surprises that keeps getting us in trouble with customers is annual maintenance costs," which have been increased, Andelman said. One customer "squealed like a stuck pig" when quoted a VAX software maintenance price, he added.

"It seems simplified, but it's not that simple," agreed Bill Rosas, president of Worldcom Exchange, Inc. in Salem, N.H. He said the tricky part is administering a 75% upgrade credit that Digital is offering to entice customers to migrate from VAX to Alpha products. Determining the value of an old VAX software license is no easy task, he added.

Greg Casto, who heads the Digital Dealers Association, made a brief presentation describing the new system at December's Digital Equipment Computer Users Society conference. When he finished, a Digital official stood up and told him he had it wrong.

In response, Casto invited Digital representatives to the association's meetings held last week in Irvine, Calif., and coming up on March 9 in Natick, Mass., for further clarification.

Specifically, Casto said he would like to see written procedures from Digital on how to implement the program. He also said he has questions about liability and chargebacks if a mistake is made.

A Digital spokesman said overall the program has been well received. He claimed that users will have lower lifetime software costs because the new system allows free movement of licenses within the three broad systems categories: workgroup, departmental and enterprise.

However, the spokesman acknowledged that the trade-in credit "needs a little bit of explanation." But that is just "a matter of educating people and explaining it a little more," he said.

Some supporters

Not everyone has been thrown by the new policy. C. D. Smith, owner of C. D. Smith & Associates, Inc., a reseller in New Braunfels, Texas, said the system puts Digital on an even playing field with other firms.

The trade-in credit has accelerated Alpha sales because it makes it more attractive for VAX customers to migrate to Alpha, Smith said. "It makes it more attractive to stay with DEC, and it's helped me get more business," he added.

Dennis Spillane, president of Software Management Associates in Westwood, Mass., said the new system is easy for new customers, but there are still some wrinkles for existing customers.

To get the trade-in credit, they need to physically produce the old license, which is not always easy to do. And they have to make sure the old license is valued correctly.

Price changes

Under the new pricing plan, some high-end software licenses will cost less, while some low-end licenses will cost more. The price changes range from an increase of $6,560 to a decrease of $18,250.

On Mooday, March 6th, the Michelangelo virus will awaken from its year-long slumber and activate.

Only this year, unlike the last two years, Michelangelo will awaken on a business day. A business day that you are almost certain to boot your computer system, allowing Michelangelo to destroy the many megabytes of data on your computer's hard drive.

If your computer has been infected with this virus, on March 6th it will corrupt your hard disk's partition table. Making it impossible for DOS to access your data.

Fortunately for you, the Michelangelo virus can be eliminated before it activates.

As a world leader in virus protection software, we felt it was our duty to warn and protect you from this threat. As a public service, we urge you to take precautions today.



protection from virus threats.

If you don't have any of these antivirus software tools, take a moment to download the free version of Norton AntiVirus® we've specifically designed to detect and totally eliminate the Michelangelo virus from your system. This special edition will also scan for other known virus strains as well.

If you already own a copy of Norton or Central Point antivirus software or if you are running MS-DOS 6.0 or later, we urge you to run your antivirus software today and every day for maximum protection.

MICHELANGELO MAY HAVE INFECTED YOUR COMPUTER. PLEASE TAKE THESE PROTECTIVE MEASURES BEFORE MARCH 6TH.

GET THE FREE NORTON ANTIVIRUS MICHELANGELO EDITION.

AMERICA ONLINE: SYMANTEC

WORLD WIDE WEB: www.symantec.com

COMPUSERVE FORUM: GO SYMANTEC

We at the Peter Norton Group of Symantec urge you to take these free protective measures to shield yourself against the chance that your computer has been infected with the Michelangelo virus.

Download our free version of Norton AntiVirus through any of these on-line services or call us for information by fax. It will only take a few minutes and it could save the entire contents of your computer's hard drive.

SYMANTEC.

Symantec does not warrant that the Norton AntiVirus will meet your requirements or that all strains of the Michelangelo virus will be protected and eliminated. IN NO EVENT WILL SYMANTEC BE LIABLE TO YOU FOR ANY SPECIAL, CONSEQUENTIAL, INDIRECT OR SIMILAR DAMAGES, INCLUDING ANY LOST PROFITS OR LOST DATA ARISING OUT OF THE USE OF THE NORTON ANTIVIRUS. Symantec and the Norton AntiVirus are trademarks of the Symantec Corporation. All other trademarks are the property of their respective holders. ©1995 Symantec Corporation

PRESENTED AS A PUBLIC SERVICE ANNOUNCEMENT.

Why your information systems should be Architected for Change.



BUSINESS NO 15 REALITY

Find the perfect solution for your business and the problem will change.



No company is a stranger to change. Whether or not change is a liability, however, depends on the flexibility of your information system. Therein lies the beauty of Sybase.

We've been the fastest growing company in the relational database industry because of a simple but profound idea: Information systems that adapt to change give your company a sustainable business advantage.

You see, other companies sell you a short-term fix with a long-term drawback. You get locked into doing things their way.

Sybase, on the other hand, solves your immediate needs within an adaptable architecture that's prepared to handle future change.

Sybase further lets you do business your way with a full line of high-performance database servers, development tools, interoperability products, and best-of-breed applications from leading software partners.

That explains why companies like Federal Express, MCI, and Avis have selected Sybase. Call 1-800-SYBASE-1, ext. 6810 to learn more.

It'll be well worth your time. Because tomorrow, everything will change.

SYBASE®

Architected for Change™

Outside the U.S. call 410-224-8044 © 1995 Sybase, Inc.

Wireless mobile computing hits Wall Street

By Michael Fitzgerald

The wireless industry got its first integrated, vertically oriented package this week.

Compaq Computer Corp., RAM Mobile Data USA L.P., Wireless Technologies, Inc., Telescan, Inc. and AT&T Corp. have pulled together to sell the Mobile Financial Workstation. Aimed at investment bankers, the package was designed to give traveling financial types instant, wireless access to stock information through Telescan's on-line stock service. Users can also place orders in real time.

Stockbrokers contacted said they had some interest in the package.

"I hate to carry anything when I'm traveling. But if I am going to carry something, either it's going to be a telephone or something I can do E-mail with and get quotes over," said Jim Hansell, an analyst at UBS Securities, Inc. and formerly an information systems manager at the company. He said UBS is very likely to look into the pros and cons of Mobile Financial Workstation.

One beta tester said he found the package interesting but said he would not likely be a user.

"I did find a great use for it," said Mark Langley, an equity analyst at Gruntal & Co., a New York brokerage. Langley said during a break at an analyst meeting he had to stand in line at a small bank of payphones. "Had I been using this [to type] my notes at the analyst meeting, I could have just gone to a window and zapped all my notes to the office," he said.



UBS Securities' Jim Hansell *says the firm will consider Mobile Financial Workstation*

Still, Langley said he would have little use for the package, though analysts who travel more might find it useful. He also said he did not like the external floppy drive on Compaq's Contura Aero and that Telescan runs slowly over RAM for larger queries.

Langley said a PCMCIA version of the modem would reduce the package's bulkiness.

"One of the nicest features is that you can just purchase the package, you don't have to piece it together yourself," Langley added.

The sum of the parts

The diversity of the vendors involved indicates the variety of pieces needed to put together a wireless application. In this case, Compaq provides the hardware, RAM Mobile Data contributes the carrier services, Telescan furnishes the software application, and AT&T provides Mail for electronic mail. Wireless Technologies, in one of the first fruits of its numerous relationships, provides the configuration and distribution arm.

With a Contura Aero subnotebook and a GE/Ericsson Mobidem wireless modem, the package costs $2,548.

Analysts said targeting the investment community was a smart move.

Wall Street "is one of the few markets where wireless information services are actually thriving," said Alan Reiter, editor of "Mobile Data Report," a newsletter in Alexandria, Va. He said financial users benefit from information on demand and that "financial people are used to paying a significant amount for financial information, and they need it in a hurry. Seconds count."

Iain Gillot, an analyst at Link Resources Corp. in Framingham, Mass., said, "It's a good announcement, especially since [Wireless Technologies] is involved. They've been signing up a lot of relationships, and we haven't really seen anything coming out the other end, so this is a sign that more of that is to come."

Announcing COMPUTERWORLD CD

announce the arrival of [illegible]. Now, all the valuable information that you rely on every week is available through the exciting technology of CD-ROM. Just think, four years of COMPUTERWORLD at your fingertips...no more piles of back issues in the corner, no more frantic searches through pages of newsprint ... years of COMPUTERWORLD ready for searching, analyzing, cross-indexing and competitive analysis.



Here's What You Get When You Subscribe

- Over four years worth of full text articles from COMPUTERWORLD.
- Selected graphics from each issue showing industry trends, product comparisons and more.
- Articles from COMPUTERWORLD's annual *Premier 100* and *Computer Careers* magazines.
- Detailed information from the *Premier 100* – data about IS budgets, profit growth, total scores and company highlights about all the Premier 100 companies.
- Over five years worth of articles from the *Journal of Information Systems Education*, published by DPMA's Special Interest Group on Education (EDSIG).
- Annual subscription includes four discs updated quarterly.

COMPUTERWORLD CD Helps You:

- Search comprehensive product and vendor information quickly.
- Follow critical technology trends.
- Analyze top company IS profiles.
- Execute key word searches on any topic in seconds.
- Eliminate mass paper storage.

COMPUTERWORLD CD operates on PC (DOS and OS/2), Mac, and Windows environments.

Subscribe today and become a charter subscriber for just $295. You save $100 off the regular annual subscription rate of $395.

Don't miss this opportunity to have quick access to the most powerful news source on information systems.

To order call:

1(800)285-3821

What users like about COMPUTERWORLD CD:

"It can look up products and company names...indispensable."

"...finds product information and client information quickly."

"...full base text, good graphical start for each article."

"Can search across multiple issues and find the thing I'm looking for. Makes life easier."

"The sheer volume of what's in it. Easy access without having to go to a library service."

"It has information not found on Computer Select."

Source: Survey of COMPUTERWORLD CD subscribers, May 1993.

ETA Emerging Technology Applications
Attn. Sales Department
111 Speen Street, Framingham, MA 01701

All trademarks are property of their respective owners.

CD-2/20

The TPC says our servers have the best price/performance.

D. H. Brown says we're #1 in single system high availability.

And now IDC® says we're the world leader in medium-scale UNIX systems.

How many more reasons do you need to put us on your short list?

If you're so much as considering moving to a distributed environment, consider us.

Our open servers give you more of what you're looking for.

Leader in price/performance.

Like more horsepower. For less money. An area where our servers have traditionally come out on top.

And now even more so. In fact, the Transaction Processing Performance Council (TPC™) recently posted a record 1,649 transactions per second (tps-A)[1] with a cluster of our Model 3575 servers running AT&T LifeKeeper™ Fault Resiliant Systems software.

Which means that at $6,944 per tps-A, our clustered servers deliver the best price/performance in the industry.

Better than HP. IBM. Compaq.

Better than anybody.

Highest single system availability.

We didn't say it. D.H. Brown Associates® did. They evaluated six major UNIX-based high availability solutions.[2]

Here's what they found.

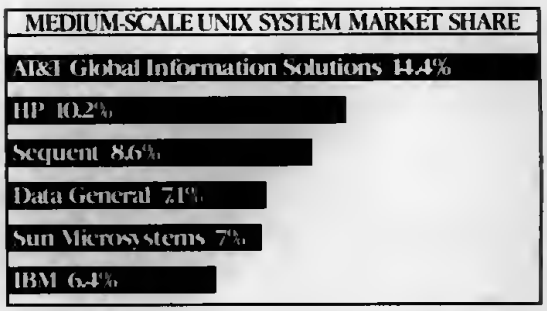
Ours provided the best single system availability. Beating out competitors like IBM, Digital, HP and Sun.

In the dizzying world of client/server, that could make all the difference. Between a solution that saves you a bundle. Or one that costs you sleep.

#1 in medium-scale system sales.

We're not only the leader in server price/performance and reliability.

According to IDC, we're also the leader in medium-scale Unix system sales.[3] With 163% growth last year alone.



Call us at 1 800 447-1124, ext. 1007.

So if you're planning to move to a distributed environment, give us a call.

We'll send you our free Server Information Kit. With magazine excerpts and consultant reports.

And make sure you put us on your short list.

You'll be in good company.

[1]TPC-A Benchmark Tests, July 1994. TPC-A, tps-A and TPC are trademarks of the Transaction Processing Performance Council.
[2]"UNIX Leapfrogs in Commercial Availability" ©1994 D.H. Brown Associates, Inc.
[3]"Unix Systems Market, 1993-1998" ©1994 International Data Corporation.
© 1995 AT&T Global Information Solutions. All Rights Reserved.

GET move USE IT.

Now that NCR and AT&T are one, computing and communications have come together to help you get, move, and use information.

AT&T
Global Information Solutions

'Tech budget' faces congressional fire

Administration drops R&D tax credit; observers fear other cuts

By Gary H. Anthes
WASHINGTON

Despite much ado about government downsizing, President Clinton recently sent Congress a budget calling for increases — some in double digits — for programs aimed at developing new computer and communications technologies.

That is the good news for computer users and vendors. The bad news is that the programs may not survive a Republican-led Congress unscathed.

In a budget document accompanying their "Contract with America," Republicans called for a 20% cut in the government's High Performance Computing and Communications program and elimination of the Commerce Department's Advanced Technology Program (see chart). Republicans are generally hostile to federal funding of commercial technology development, saying the government should not be in the business of "picking winners and losers."

"Technology programs are ripe for a big battle with Republicans," said Jon Englund, director of national affairs at the American Electronics Association in Washington. "A lot of what the president wants is going to be cut."

However, some observers argued that Clinton's technology programs are safe because influential Republicans such as House Speaker Newt Gingrich (Ga.) and House Science Committee Chairman Robert Walker (Pa.) are techno-enthusiasts.

But so far, the signs from Capitol Hill have been ominous. At a recent Senate hearing on Commerce Department technology programs, Larry Pressler (R-S.D.), chairman of the Commerce, Science and Transportation Committee said, "I note that no South Dakota firm has ever received a grant from the [Commerce Department] Advanced Technology Program. And none of [its] Manufacturing Technology Centers provide any technical assistance to any company in my state."



Budget cuts at the House Ways and Means Committee left a pile of unused computers offered up by Rep. Bill Archer

No credit

In a less obtuse piece of bad news for high-technology companies, the White House failed to include in the budget an extension of the research and development tax credit. Clinton campaigned on a promise to make the temporary credit — which has been given several 18-month extensions — a permanent one.

"Basically this means the administration is walking away from the credit," Englund said. "This is a big problem. It sends precisely the wrong signal to the R&D community at a time when R&D budgets are tightening," said Ken Kay, spokesman for the industry Working Group on Research and Development in Washington.

Meanwhile, high-tech industry spokespeople said they will now ask Congress for another 18-month extension for the credit, worth an estimated $2.8 billion.

In its budget request, the White House added several troubled systems projects to its "high-risk" hit list, including the following:

- The Agriculture Department's $1 billion Infoshare project entered the hall of shame for its failure to complete business requirements analysis before planning hardware purchases.
- The $4 billion modernization of National Weather Service systems earned poor marks for cost overruns, schedule slippages and user acceptance problems.
- The administration said $1.6 billion was at risk in the $6 billion effort to overhaul the Federal Aviation Administration's air traffic control systems.

The White House said it will seek legislation that would turn over FAA air traffic control services to a quasi-public corporation that would be free of most federal regulations and operate on user fees. It also recommended privatizing parts of the National Weather Service and NASA's Space Network.

High-tech highlights of the president's budget

Multi-agency program	FY 1995 budget (estimate)	FY 1996 budget proposal
High-performance computing and communications	$1.08B	$1.14B
Government/industry research partnerships	$5.1B	$5.81B
Agency/program		
National Science Foundation/ Computer and information science	$258M	$276M
Advanced Research Projects Agency/ Technology Reinvestment Project	$443M	$500M
National Institute of Standards and Technology/ Advanced Technology Program	$431M	$491M

Source: U.S. government budget, Office of Management and Budget, Washington

Big players could squeeze TCP/IP vendors

By Suruchi Mohan

Small vendors of products based on TCP/IP are scrambling to respond as the industry bigwigs start to play in this arena. Although most observers agree that this business will never be the same, many of the small providers seem to be in a state of denial.

IBM has put TCP/IP functionality into its OS/2 Warp and Microsoft Corp. plans to include it in Windows 95.

"Once Windows 95 rolls out, smaller companies will face a challenge," said Tom Nolle, president of CIMI Corp. in Voorhees, N.J. Although IBM's and Microsoft's moves will undoubtedly bring TCP/IP into the limelight, he said, some of the traditional players will have to close shop while others will continue to do well. It is too early in the game "to say who will be who," he said.

TCP/IP market leaders include FTP Software, Inc. in North Andover, Mass., Ipswitch, Inc. in Wakefield, Mass., and Process Software Corp. in Framingham, Mass. The explosion of TCP/IP connections may be attributed in part to the runaway popularity of the Internet, the spread of Unix and the need to connect heterogeneous platforms (see chart).

Necessary step

The TCP/IP vendors are, perhaps, paying the price for this great demand. Now that the market has been established, the operating system providers want to give their users the option to connect to the outside world.

Some think this is the way it should be. "IP should be embedded in the operating system," said Steve Rose, vice president of systems services at C&S Networking, an integrator in St. Paul, Minn. "It shouldn't be from a third party."

Rose said IBM and Microsoft's offerings will make his life as an administrator simpler because he will not have to pick up different IP stacks for different products. "It will make my life easier because I won't have to support so many stacks. It eliminates confusion," he said.

But the small TCP/IP providers are not buying this idea. Ipswitch President and Chief Executive Roger Greene acknowledged that bundling TCP/IP software with operating systems will take a bite out of the market, but he said he is not worried. "TCP/IP is not a commodity. We feel there is a very important segment of the market that is willing to pay extra" for additional functions that his firm provides, including routing and Network File System, he said.

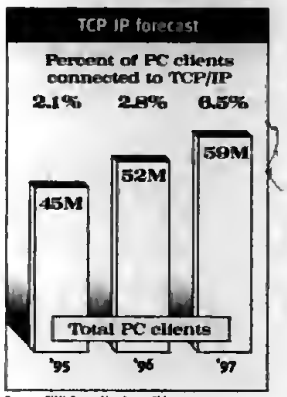
Other executives from small suppliers said they provide more specialized and better support services than Microsoft or IBM can in the TCP/IP arena.

An IBM spokesman disputes that, saying IBM provides 90 days of free support for OS/2 Warp, which includes the TCP/IP component. After that, users can get support for a fee.

Another extra that smaller vendors provide is compatibility, they said. Dave Rosenlund, director of marketing at Process, said his company's software works across many platforms, providing users with far more flexibility in heterogeneous environments.

Glenn Williams, engineering manager at Grumman Data Systems in Herndon, Va., agreed. He said his company would have gone for TCP/IP software from the larger companies such as Microsoft and IBM if their software had been compatible with one another.

"The problem has been getting the software to work," he said, adding that the TCP stack he has from Ipswitch works with both companies' products. Indeed, he said, that may be a big selling point for the small companies.



Source: CIMI Corp., Voorhees, N.J.

Does the perfect office really exist?



In the



Who wouldn't want to work at the perfect office? A place that's friendly. Where everyone works together. A place you can actually get some work done. Well, now you can work there. Because the perfect office exists anywhere new PerfectOffice™ is put to work.

NEW PERFECTOFFICE FOR WINDOWS

1 In the perfect office, your software would make it easy to work with other people.

PerfectOffice is the first network suite. Sort of natural, considering it's made by NovelI.

It gives you workgroup integration right out of the box—like E-mail, scheduling and task management. (Have you ever tried scheduling a meeting with Microsoft Office?) Plus, PerfectOffice is easier to install and administer on a network.

2 In the perfect office, you'd work between programs without walls.

When it comes to suite integration, a common look and feel is a nice place to start. (Or end, as Microsoft Office does.) But we've taken integration further, offering OLE 2.0 functionality throughout the suite, thus opening up the borders between programs. So you can "drag and drop" a chart from say, Quattro® Pro to WordPerfect,® without a hitch. And then edit that chart in WordPerfect as if you were in Quattro Pro.

And thanks to exclusive PerfectFit™ Technology, applications share more common components such as a speller, thesaurus, grammar checker and file manager. Which saves system requirements. (Something else PerfectOffice does better than Microsoft Office.)

Jeff Newman for Marketing VP

The perfect office would have no politics.

Bottom line, you get an entire suite that looks, feels and more importantly, acts like one program. All of which makes it easier to learn and use.

3 In the perfect office, you'd delegate entire tasks to your software.

Imagine software that works for you, not vice versa. Enter new, remarkable QuickTasks.™ They automate entire processes—such as creating and E-mailing a memo—all at the touch of a button. And it's done right from the desktop, automatically switching between programs (unlike Microsoft Office, which forces you to do all the work).

4 In the perfect office, you'd automatically be a better writer.

It's true. Thanks to the introduction of PerfectSense,™ intelligent tools that actually understand the meaning and context of words. PerfectSense can automatically rewrite entire sentences, correcting both spelling and grammatical errors.

Too bad you didn't have this in 9th-grade English, huh?

The perfect office would have no dress code.

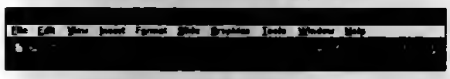


PERFECTOFFICE LETS YOU PERFORM SIMPLE AND COMPLEX TASKS JUST BY CLICKING A BUTTON. AND YOU CAN DO IT RIGHT FROM THE DESKTOP.

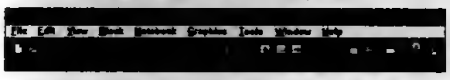
IN PERFECTOFFICE, ONE APPLICATION



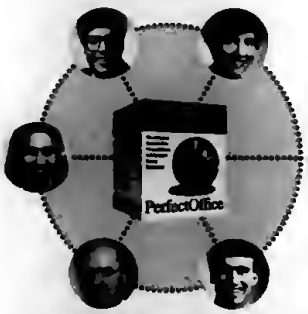
LOOKS AND ACTS LIKE ANOTHER, WHICH



LOOKS AND ACTS LIKE ANOTHER, WHICH



MAKES LEARNING AND USING THE SOFTWARE EASY.



PERFECTOFFICE WAS BUILT SPECIFICALLY FOR NETWORKS. SO YOU CAN WORK WITH OTHER PEOPLE. NOT JUST OTHER APPLICATIONS.

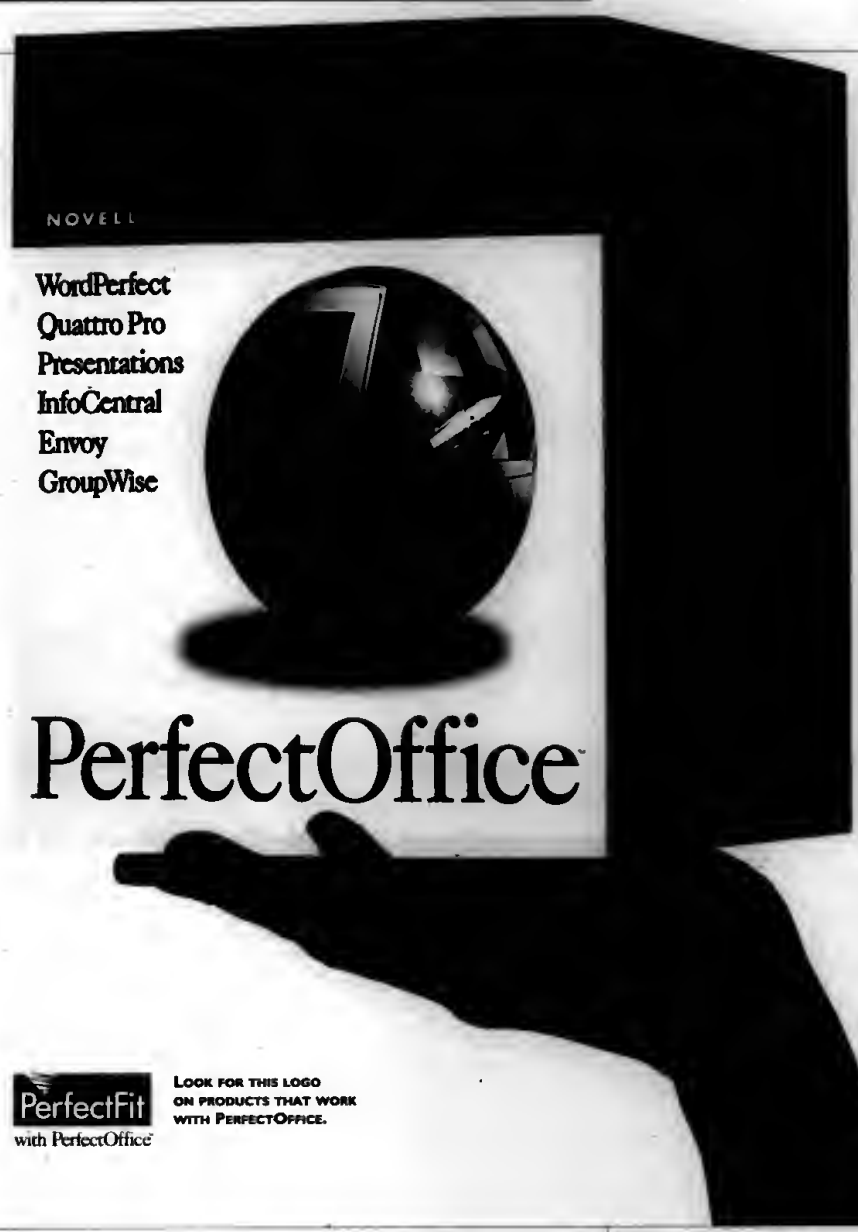
WordPerfect® 6.1
The world's best-selling word processor, with intelligent new features that make you a better writer.

Quattro Pro 6.0
The easiest-to-use spreadsheet, creating more types of charts and graphs than any other.

Presentations™ 3.0
The innovative program that helps you create more effective presentations.

*Support policies are subject to change without notice. **GroupWise includes Quick Look client software and a single-user license. Requires separate server software for network operation. ©1996 Novell Inc. Novell, the N-design logo, WordPerfect and Quattro are registered trademarks of Novell, Inc. The NetWare logotype (tooth logo), PerfectOffice, The Perfect Place to Work, GroupWise, Envoy, PerfectFit, PerfectSense, QuickTasks, Presentations, The Perfect Way, InfoCentral, and AppWare are trademarks of Novell, Inc. All rights reserved. †Paradox is a registered trademark of Borland International Inc. Microsoft is a registered trademark of Microsoft Corporation.

flesh.

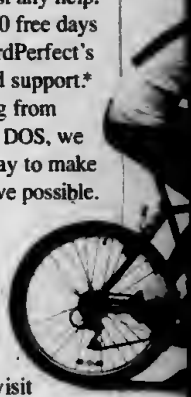


5 **In the perfect office, everyone would share ideas.**

It's called collaboration. And only PerfectOffice offers Envoy,™ a workgroup publishing tool that lets users electronically view, annotate and distribute your documents—complete with graphics and typefaces. They don't even have to have Envoy or the software they were created in.

6 **In the perfect office, people would always be willing to give you some help.**

Not just any help. But 180 free days of WordPerfect's world-renowned support.* If you're moving from WordPerfect for DOS, we go out of our way to make it the easiest move possible. PerfectOffice.



The perfect office would have a very short commute.

It's the Perfect Place to Work.™ For a free tour, visit your reseller, or order directly by calling **1-800-526-2801.**

PerfectFit with PerfectOffice

LOOK FOR THIS LOGO ON PRODUCTS THAT WORK WITH PERFECTOFFICE.

InfoCentral™ 1.1
The personal information manager (PIM) for your appointments, phone numbers, tasks and more.

Envoy 1.0
Electronic publishing software that lets anyone view, annotate and distribute documents

GroupWise™ 4.1
Formerly WordPerfect Office,™ it's our new integrated E-mail, calendaring and scheduling program

Professional Edition
Includes all the products in PerfectOffice Standard plus Paradox® 5.0 database and AppWare™ 1.0 visual development tools.

PerfectOffice™

NOVELL.

THE PERFECT PLACE TO WORK

Briefs

Kahn backs Starfish

Borland International, Inc. founder Philippe Kahn has launched Starfish Software, a Santa Cruz, Calif.-based venture that will produce slimware. Starfish bought Sidekick for Windows and Dashboard for Windows from Borland and will use Borland's Delphi product to develop consumer software for Microsoft Corp.'s Windows 95. Borland, which holds a minority stake in Starfish, will disband its Simplify consumer products division.

Microsoft sued

Touch screen developer AVI Systems, Inc. has sued Microsoft Corp., alleging improper use of the AVI trademark to identify Microsoft software and technology that plays audio and video sequences in Windows. The Oakland, Calif., company wants to prohibit the release of Windows 95 with the AVI trademark.

Televideo posts loss

Video display terminal developer Televideo Systems, Inc. reported sales of $13.2 million and a $907,000 loss for fiscal 1994 ended Oct. 31, 1994. This compares with $15.3 million in sales and a $9.6 million loss in fiscal 1993. The results do not reflect the San Jose, Calif., firm's recent move into multimedia peripherals, which will appear in fiscal 1995 figures.

SHORT TAKES CompuCom Systems, Inc. has halted negotiations to purchase Trellis Network Services, Inc. ... Pauline Lo Alker, president and chief executive officer of Network Peripherals, Inc., has been appointed to the board of directors of Insignia Solutions, Inc. ... David Liddle has resigned from Borland's board of directors. Liddle, who also serves on Sybase, Inc.'s board, resigned due to a conflict created by Sybase's pending acquisition of Borland rival Powersoft Corp.

Visigenic takes less-traveled path

Company shelves V/Forms graphical development tool kit to focus on ODBC

By Kim S. Nash

Two-year-old Visigenic Software, Inc. plans to announce next month that it will exit the crowded client/server development tools market to focus exclusively on Open Database Connectivity (DDBC) drivers for "non-Microsoft platforms," company officials confirmed last week.

In the process, Visigenic has canned V/Forms, a graphical development kit that was supposed to ship 11 months ago, said Mark Hanson, an executive vice president at the San Mateo, Calif.-based company. There are no plans to sell off the technology nor are layoffs planned, he added.



Visigenic founder Roger Sippl *will relinquish day-to-day company duties*

V/Forms initially targeted Informix Software, Inc. database users, who lacked graphical object tools. However, Informix has since developed New Era, an object-based development tool intended to appeal to those same users.

In talking with potential corporate and third-party customers about V/Forms, Visigenic saw "pent-up demand" for DDBC drivers for platforms other than Windows-based systems, Hanson explained. "We thought [having] all our eggs in the ODBC basket would be less crowded, and we could still accomplish the same amount of revenues and profits" as estimated in Visigenic's original business plan, he said. Hanson declined to specify financial goals.

V/Forms was conceived as a second-generation development tool kit that included application partitioning. Release 1.0 was in beta testing at 10 to 20 Informix database sites when it was nixed. Product plans had called for support for Sybase, Inc., Oracle Corp. and other databases [CW, Jan. 17, 1994].

Change of heart

Visigenic signed an exclusive licensing deal with Microsoft last October, giving Visigenic the rights to sell developer's kits for ODBC on Unix and Macintosh systems. By November, Visigenic had decided to stop work on its V/Forms client/server tool and concentrate only on ODBC products.

Conflict of interest?

Visigenic founder Roger Sippl plans to relinquish day-to-day company duties to run for chairman of X/Open Co., a group of vendors aiming to set interoperability standards, a Visigenic spokeswoman said. Sippl will keep his position as chairman of Visigenic, and he will remain the primary investor in the company.

The SQL Access Group, which originally conceived DDBC, merged with X/Open last December. That means Sippl would lead both X/Open, which now oversees DDBC, and Visigenic, which hopes to make its fortunes from the specification.

Hanson maintained that no conflict of interest exists, pointing out that X/Open and SQL Access Group members include many vendors that sell DDBC drivers, including Intersolv, Inc. in Rockville, Md. Intersolv competes with Visigenic in the market for ODBC products that run on Unix and Macintosh systems.

"Roger has to be cautious about using the chairmanship to tell customers that [Visigenic has] some unique edge," said Gary Greenfield, chief operating officer at Intersolv.

Hiring practices

Microsoft scrambles to find 'brightest'

By Stuart J. Johnston

To maintain its phenomenal growth rate, even as the curve slows, Microsoft Corp. must continually and aggressively recruit high-quality employees. But to meet its equally ambitious development goals and appropriately staff more enterprise-oriented projects, the Redmond, Wash.-based firm has had to alter its traditional approach of going after young, fresh recruits.

From its earliest days, Microsoft has had a penchant for hiring the best and brightest computer science graduates. These recruits tend to be eager and willing to work long hours — for less than the going rate — in exchange for the opportunity to cash in on the industry's most generous and lucrative stock options.

A few years ago, the average age of a Microsoft employee was well below 30 years old. Today, however, the influx of older workers, combined with the retention of existing employees, has driven that number into the low 30s. This is the result of networking and server-oriented projects, which require experienced people who understand corporate customers' problems with client/server computing.

For example, Jim Allchin, senior vice president of the Business Systems Division, jokes that he single-handedly raised the average age by hiring older personnel for his group, which is responsible for Windows NT and all server products.

Today, Microsoft employs 16,000 people worldwide as well as approximately 3,000 contractors.



Mike Murray, *Microsoft's vice president of human resources, says turnover has been minimal*

Low turnover

Despite heavy demands on employees, the average turnover rate runs between only 7% and 10% per year, according to Mike Murray, Microsoft's vice president of human resources and administration.

"In a company like that, that's growing like crazy, with all the stress and hornoot, that's admirable," said William A. Grady, partner at Boston-area recruiting firm Romac International.

Grady said the practice of hiring recent college graduates is a fairly common and well-tested technique, but companies must be careful to provide career paths to retain workers as their skills develop.

In fact, Murray said, Microsoft does just that. It provides career paths in both product and technical management and for developers who do not want to move into management in order to advance. Developers who eschew management can advance to "architect," which is roughly the equivalent of a vice presidency, Murray said.

Microsoft has also designed a set of courses that teach management skills and how the company develops software. A course for midlevel managers, taught by senior executives, explains how the company does business internally.

Other factors that help create an effective infrastructure include an extremely flat management organization, the use of semiautonomous product development teams and a heavy reliance on the corporate network for electronic mail as the primary means of communication.

TELL ME HOW EDA/SQL MIDDLEWARE WILL IMPROVE MY "OPERATIONS".



- ❑ Please send me your FREE video "EDA/SQL Client/Server Solutions in Action".
- ❑ CAN'T WAIT. Please have a sales representative call me ASAP.
- ❑ I'm planning to purchase a middleware solution in: ❑ 1-3 mos. ❑ 3-6 mos. ❑ 6-12 mos.

NAME _____ TITLE/DEPT _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

( ) TELEPHONE _____

EDA/SQL is a registered trademark of Information Builders, Inc.
Printed in USA
CW 22095

Information Builders

CALL 800-969-INFO
In Canada call 416-364-2760

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO 1305 NEW YORK, NY

POSTAGE WILL BE PAID BY ADDRESSEE

ATTN; Product Information Center
Information Builders
P.O. Box 1461
New York, NY 10117-1484

"EDA/SQL MIDDLEWARE MEANS BETTER REPORTING FOR OUR STAFF AND BETTER HEALTHCARE FOR OUR PATIENTS."





James Wells, VP and CIO
Magee-Womens Haspital
Pittsburgh, PA

With Informix databases for radiology systems, Gupta databases for labor and delivery systems, C++ databases for laboratory systems, VSAM databases for financial applications, and Shared Medical Systems proprietary databases for hospital information, Magee-Womens Hospital in Pittsburgh boasts one of the most complex information environments anywhere. How does the hospital combine and report from data located in so many heterogeneous file structures and operating systems without hiring a boatload of expensive programmers and application specialists? The answer...EDA/SQL middleware from Information Builders.

INVESTING IN THE RESOURCES THAT COUNT!

With EDA/SQL middleware, the hospital's doctors, nurses, technicians, accountants, administrators, and marketers can all use today's most popular front-end applications and reporting tools for transparent access to the information they need, no matter how it's structured or where it resides. So instead of investing in more programming resources, it can invest in superior patient-care and research to better serve the community. Perhaps this is why Magee-Womens Hospital was cited as one of the top 10 hospitals in the nation.

SEND FOR A FREE VIDEO!

EDA/SQL...the process is transparent, the benefits are obvious. For more information and a free video on how Magee-Womens Hospital and other companies have realized outstanding benefits from EDA/SQL middleware, contact your local Information Builders sales office or call **1-800-969-INFO.**
In Canada Call 416-364-2760

EDA/SQL®
Transparent Enterprise Data Access

Information Builders

EDA/SQL is the trademark of Information Builders, Inc., 1250 Broadway, NY, NY 10001.

Copyright ©1995 Legent Corporation. Product names mentioned herein may be trademarks and/or registered trademarks of their respective companies. ©1995 M. C. Escher / Cordon Art - Baarn Holland. All rights reserved

It's déjà vu. You've been here before.

The hardware is different. The systems are different. But the problems look awfully familiar. Operations management, resource management, storage management, configuration management, application management, problem management. Doesn't some of this stuff go back to Univac II? And yet, here you are at square one, spending way too much time on the most mundane part of your job. If only there was some management software out there that actually helped. Well, actually, there is. At Legent, we've put together the most extensive set of industrial-strength, distributed systems management tools available. We've also developed an open architecture called XPE that, according to some of the toughest analysts in the business, is pretty remarkable. As a result, our software works together across almost anything you can wire together, regardless of function or platform, from mainframes to UNIX servers to PC LANs. Which means you can manage your systems from the platform of your choice, something our customers tell us has definitely made their lives easier. Think of it: systems management tools that really work. It's déjà vu all over again.

A dose of reality

Whenever my head gets too full of 32-bit multimedia operating systems and gigabit networks to the desktop, I like to head out and spend some time with "real people." A couple of weeks ago, I spent time with about 400 of them in Nashville at the Mobius Management Systems User Group meeting.

Real people are what Mobius President Mitch Gross calls "the steak, not the sizzle" of the computer industry. They worry about things such as how to distribute a 100 million-page report every month and then store it so a customer service rep can grab any single page in less than 10 seconds.



Real people buy $100,000 mainframe report distribution products from companies such as New Rochelle, N.Y.-based Mobius because they can recoup the investment in a single report run. Real people worry if two terabytes of DASD is enough. Real people deal with the legal requirements of being able to retrieve every document a large insurance company has generated for the past 30 years.

The sizzle merchants in the computer industry might call these people tired old mainframe bigots. But the real people at the user group meeting came from the companies that make vendors salivate — Blue Cross/Blue Shield of Illinois, Prudential Insurance, Humana, Arthur Andersen, Kaiser Permanente Health Plan and so on.

The real people at Wachovia Operational Service Corp. in Winston-Salem, N.C., have eliminated a monthly archiving process that used to produce 343,000 pages of microfiche. Now it's all on tape — real savings. A Dallas-based financial services company provides 3,300 customer service reps with six months' worth of statement data for 6 million customers in less than 15 seconds.

I couldn't resist asking these real people about a couple of things the industry thinks are tremendously important right now, such as when the last mainframe in America will be turned off. When asked if they expect to still be running their mainframes in the year 2010, about 390 of the 400 people in the room raised their hand — real people. Yet not a single person would commit to having Microsoft's Windows 95 installed on more than a quarter of their desktops by the end of the year — real answers.

Real people don't buy glitz, they don't beta-test, and they aren't blinded by technology. All they do is manage the data centers that keep businesses running in industries in which 24 hours of downtime means Chapter 11 bankruptcy. The industry should get to know more real people.



Paul Gillin, *Editor*
internet: *pgillin@cw.com*



Don't count Cobol experts out yet

I spotted a notice in the Dec. 12, 1994, issue asking employers who are looking for Cobol experts to advertise in your "Cobol Careers" section in the Dec. 19 issue. Finally, I thought, something I can use! So I anxiously scoured the Dec. 19 issue when it arrived and found nothing that even remotely resembled a "Cobol Careers" section. In fact, the closest thing I could find was an encouraging article ["Sweat the small stuff," CW, Dec. 19, 1994] about how Cobol programmers could still find "success in the backwater of corporate maintenance divisions."

I'm glad to know there's still hope for us backward dolts who know nothing but mainframe applications. Maybe, with any luck, I can muck my way through this obsolete technology until retirement ... as long as I retire in the year 2001. From what I've read in *Computerworld*, there won't be any work for mainframe programmers after that.

Drop me a line if you decide to start printing articles that have meaning to people who aren't on the bleeding edge of technology.

Kevin Lee
Greenwood Village, Colo.

Caution is the rule

In response to "Client/server costs hard to divvy up" [CW, Jan. 23], chargeback systems are an accountant's answer to management's inability to make rational strategic decisions. Widely deployed, chargeback systems generally turn into a free-for-all of internal departmental profiteering: "The company lost money last year, but my department made a profit!"

More than one company has accounted itself into bankruptcy, fiddling with internal revenue transfers while its market drifted away. Sure, you need to have a pretty good idea what your costs are, but don't let chargeback formulas tell you how to run the company.

Stuart D. Alderman
Claremont, Calif.

Secure systems

Regarding "On-line libel: A $200 million bug" [CW, Jan. 23], operators of computer communications networks must design their systems so users' identities are more positively established and accountability for publications and actions in cyberspace can be positively assured. The design and operation of computer communications systems must assure positive answers to the questions "Is that really you?" and "Did you really say that?"

The anonymity that is provided by computer-based communications must be eliminated. Personal accountability must be the rule in cyberspace as well as in real life. If it takes a few $200 million lawsuits to get service providers to beef up their network security, so be it.

Dayle L. Collins
Richmond, Va.

Internet retailers see some profit

In "Cybershoppers cruise past Internet retailers" [CW, Jan. 23], you missed areas that are successful with Internet retailing. We put our on-line airline reservation and ticketing service on the Internet in early November. By Christmas, we had registered travel profiles and credit-card numbers from users in all states and more than 50 countries. Our current projections for Internet sales are to be at a $20 million annual rate by year's end.

Our service enables consumers to access air travel information and acquire tickets at any time without paying fees. By putting the consumer in charge of an interactive process, there is an added value to the Internet.

While cybershoppers are cruising past most cybermalls, they are stopping elsewhere and spending money — in our case, hundreds of dollars per purchase.

David Lea
PC Travel
Raleigh, N.C.

BEST COMPUTER NEWSPAPER 1992, 1993
COMPUTER PRESS ASSOCIATION

■ Computerworld welcomes comments from its readers. Letters may be edited and should be addressed to Bill Laberis, Editor in Chief, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

Take a slice off the price of COMPUTERWORLD.



51 issues for only ~~$48~~. *Now Only $39.95*

Yes, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $39.95* per year - a savings of $8.00 off the basic subscription price. Plus, I'll also receive the '94-'95 COMPUTERWORLD Salary Survey FREE just for trying COMPUTERWORLD. P/Code 98

First Name _____ MI _____ Last Name _____

Title _____ Company _____

Address _____ City _____ State _____ Zip _____

Address Shown ❑ Home ❑ Business ❑ New ❑ Renew Basic Rate $48

* U.S. Only. Canada $95, Mexico, Central/South America $150, Europe $295, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the questions below to qualify for this special rate.

1. BUSINESS/INDUSTRY (Circle one)
10 Manufacturer (other than computer)
20 Finance/Insurance/Real Estate
30 Medical/Law/Education
40 Wholesale/Retail/Trade
50 Business Service (except DP)
60 Government - State/Federal/Local
65 Communications Systems/Public Utilities/ Transportation
70 Mining/Construction/Petroleum/Refining/Agric.
80 Manufacturer of Computers, Computer Related Systems or Peripherals
85 Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90 Computer/Peripheral Dealer/Dist./ Retailer
95 Other _____ (Please Specify)

2. TITLE/FUNCTION (Circle one)
IS/MIS/DP MANAGEMENT
18 Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21 Dir./Mgr. MIS Services, Information Center
22 Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr./PC Mgr., Tech Planning, Admin. Services
23 Dir./Mgr. Sys. Development, Sys. Architecture
31 Programming Management, Software Developers
41 Engineering, Scientific, R&D, Tech. Management
80 Sys. Integrators/VARs/Consulting Management
CORPORATE MANAGEMENT
11 President, Owner/Partner, General Manager
12 Vice President, Asst. VP
13 Treasurer, Controller, Financial Officer
DEPARTMENTAL MANAGEMENT
51 Sales & Mktg. Management
70 Medical, Legal, Accounting Management
OTHER PROFESSIONAL MANAGEMENT
60 Information Centers/Libraries, Educators, Journalists, Students
90 Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase (Circle all that apply)

Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

App. Development Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No

E4B5-9

Take a slice off the price of COMPUTERWORLD.



51 issues for only ~~$48~~. *Now Only $39.95*

Yes, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $39.95* per year - a savings of $8.00 off the basic subscription price. Plus, I'll also receive the '94-'95 COMPUTERWORLD Salary Survey FREE just for trying COMPUTERWORLD. P/Code 98

First Name _____ MI _____ Last Name _____

Title _____ Company _____

Address _____ City _____ State _____ Zip _____

Address Shown ❑ Home ❑ Business ❑ New ❑ Renew Basic Rate $48

* U.S. Only. Canada $95, Mexico, Central/South America $150, Europe $295, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the questions below to qualify for this special rate.

1. BUSINESS/INDUSTRY (Circle one)
10 Manufacturer (other than computer)
20 Finance/Insurance/Real Estate
30 Medical/Law/Education
40 Wholesale/Retail/Trade
50 Business Service (except DP)
60 Government - State/Federal/Local
65 Communications Systems/Public Utilities/ Transportation
70 Mining/Construction/Petroleum/Refining/Agric.
80 Manufacturer of Computers, Computer-Related Systems or Peripherals
85 Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90 Computer/Peripheral Dealer/Dist./ Retailer
95 Other _____ (Please Specify)

2. TITLE/FUNCTION (Circle one)
IS/MIS/DP MANAGEMENT
18 Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21 Dir./Mgr. MIS Services, Information Center
22 Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr./PC Mgr., Tech Planning, Admin. Services
23 Dir./Mgr. Sys. Development, Sys. Architecture
31 Programming Management, Software Developers
41 Engineering, Scientific, R&D, Tech. Management
80 Sys. Integrators/VARs/Consulting Management
CORPORATE MANAGEMENT
11 President, Owner/Partner, General Manager
12 Vice President, Asst. VP
13 Treasurer, Controller, Financial Officer
DEPARTMENTAL MANAGEMENT
51 Sales & Mktg. Management
70 Medical, Legal, Accounting Management
OTHER PROFESSIONAL MANAGEMENT
60 Information Centers/Libraries, Educators, Journalists, Students
90 Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase (Circle all that apply)

Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

App. Development Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No

E4B5-9

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD
P O BOX 2044
MARION OHIO 43306-4144

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD
P O BOX 2044
MARION OHIO 43306-4144

COMPUTERWORLD

Editor in Chief
Bill Laberis
Editor
Paul Gillin

News Editor
Maryfran Johnson
Sections Editor
James Connolly
Assistant News Editor
Patricia Keefe
Assistant Sections Editor
Johanna Ambrosio
Technical Editor
Charles Babcock
Senior Editors
Craig Stedman, Large Systems
Ed Scannell, PC Software
Michael Fitzgerald
Mobile Computing
Rosemary Cafasso
Client/Server Software
William Brandel, PC Software
Laura DiDio, Networking
Elizabeth Heichler
Application Development
Mid Atlantic Bureau
Thomas Hoffman, User Strategies
(201) 587-0090
Yuka King, Management
(215) 532-7599
Washington, D.C., Bureau
Mitch Betts, Social & Legal Issues
(202) 347-6218
Gary H. Anthes, Government & Security
(202) 347-0134
West Coast Bureau
Jean S. Bozman, Open Systems
Kim S. Nash, Databases
Steve Moore, Networking
(415) 347-9555
Midwest Bureau
Ellis Booker, Networking
(708) 827-4433
Pacific Northwest Bureau
Stuart J. Johnston, PC Software
(206) 441-7720
Senior Writers
Stephen P. Klett Jr.,
Jaikumar Vijayan, Neal Weinberg
West Coast Bureau
Mark Halper, Suruchi Mohan
(415) 347-0555
New Products Writer
Tim Ouellette
Research Coordinator
Stefanie McCann

Features Department
Senior Editors
Michael L. Sullivan-Trainor, CW Guide
Joseph Maglitta, Corporate Strategies
Lory Zottola Dix, In Depth
Allan E. Alter, Management
Kathleen Gow, In Depth
Associate Editors
Jodie Haze, Careers and Marketplace
David B. Weldon, Management
Cathleen Gagne, CW Guide
Senior Researcher
Kevin Burden, Firing Line/Scorecard
Assistant Researcher
Erin Calloway, Resource Center

Special Projects Editor
Bruce Rayner
Managing Editor, Special Projects
Joyce Chutchian Ferranti
Senior Research Manager
Bob Fink
Chief Copy Editor
Anne McCrory
Assistant Chief Copy Editor
Christina Aicardi Maguire
Senior Copy Editors
Kimberlee A. Smith, Jill Zolot
Ellen Fanning
Copy Editors
Michelle J. Keys, Jay F. Rizoli
Kimberly Gilliard, Michelle Grabon

Design Director
Tom Monahan
Senior Graphic Designers
Nancy Komal
Mitchell J. Hayes
Graphic Designers
Janell Genovese, Mary Beth Welch,
David Waugh
Cartoonist
Rich Tennant

Office Manager
Linda Gorgone
Editorial Assistants
Lorraine Witzell, Connie Brown
Aleksandra Skulte
West Coast Bureau
Chris Flanagan

Computerworld Client/Server Journal
Alan Alper, Editor
Catherine McCreary Managing Editor
Mary Brandel, Senior Editor
Stephanie Faucher, Graphic Designer

Electronic Marketplace Liaison
Lisa Davidson

Rights and Permissions Manager
Sharon Bryant

Main Editorial Office
Box 9171, 375 Cochituate Road
Framingham, Mass. 01701-9171
(508) 879-0700
TDD (800) 428-8244
MCI Mail: 279-6273
CompuServe: 76537,2413
Subscriptions: (800) 669-1002

IS execs as power brokers

Gary Heil and Tom Parker

Whether you work at a Fortune 500 company or a corner store, timely, pertinent information is the high-octane fuel of business. So it is only logical that the people who design the systems that provide that information have the power to alter the course of the organization.

> *Fortunately for information systems designers, our time is coming.*

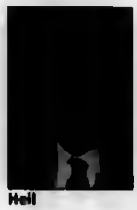
A virtual no-brainer — or is it? As is the case with any change, tampering with the flow of information in the organization inevitably meets with resistance from those who have a vested interest in maintaining the status quo. It is understandable, then, that many attempts to alter the availability and improve the quality of information fall victim to the need of those in control to hold on to the past.

Fortunately for information systems designers, our time is coming. The customer demand for greater value, combined with the information technology capable of providing that value, is bringing about a massive organizational change that nearly a century of management theory has been unable to accomplish. In the past, the power to delight customers — or not delight them, as was usually the case — emanated from the top of the organization in the form of "company policy." Now, thanks to the ready access to information by workers at all levels, that power is spread throughout the organization and ultimately to customers themselves.

Customer-specific databases and flexible manufacturing capabilities are no longer the future. Custom-printed greeting cards, made-to-measure jeans and design-your-own credit cards and pagers are yesterday's news. Tomorrow it will be custom sneaker tosoles while you wait, gene-specific drugs and maybe even a guaranteed nonsmoking room in a hotel. After decades of one-size-fits-all products and services, IS designers are rapidly making possible an era of one-size-fits-one.


Parker

In this "customized" environment, every worker will have to be able to read and analyze data about a specific customer, understand the value of that customer to the organization, recognize the peculiarities of the customer's situation and interpret this data in light of the particular process that will be used to generate value. In this scheme, the computer will be critical.


Heil

Because of his role in designing these structures, the information technology professional implicitly or explicitly shapes the future. He will become a systems architect and an increasingly important member of our organizations. Of course, responsibility for technology design will be front and center, but the more subtle roles may become even more important. We will be creating practices and methods that necessitate a very different workplace.

Different kinds of management approaches that encourage and support more responsible and better educated workers — ones who do what they think, not just what they're told — will also be required. Indeed, as information technology is used to help fulfill the organization's destiny, the nature of all our work will change. And the information technologist will be the change agent who guides the way.

Heil, Parker and Rick Tate are authors of *Leadership and the Customer Revolution*, Van Nostrand Reinhold, 1994.

Time to sharpen the data saw

Max D. Hopper

The specter of entropy casts a dark shadow over the efficient flow of information that IS managers have labored to achieve. It's an issue we don't talk much about. In fact, the remedy involves a chore so extensive we don't like to think about it and so expensive we're reluctant to try to sell it to senior management.

Yet in most companies, it's time to sharpen the saw of enterprise data management. How we respond to this challenge will profoundly affect the quality and reliability of our corporate information, as well as the speed and cost-efficiency with which our systems can deliver the answers we need.

It's time to reexamine the very fabric of our companies' business information — the data elements from which it is derived. That involves revising the enterprise data dictionary to establish a unique one-to-one correspondence between the term we use to describe a data element and the meaning related to a key attribute of our business, that we ascribe to it.

Over time, the data elements in our systems have proliferated as their meanings have evolved and mutated. That's a consequence of their manipulation and interpretation by various developers and users throughout the organization. Rather than use an existing data element as defined elsewhere in the system, these people create or derive new data elements to suit their immediate needs in a given application. By enriching the data vocabulary with synonyms, multiple meanings and conflicting and overlapping definitions, they have at least degraded overall operational performance. In the worst case, ill-defined data can even compromise information quality and result in disastrous business decisions.

> *It's time to reexamine the very fabric of our companies' business information.*

We can continue to resolve these inconsistencies with Band-Aids, but the real solution is radical surgery — we need to clean up our vocabulary. If companies are to reap the full benefits of re-engineering, a key aspect of the process will be implementing corporate data standards, with a redefined and greatly reduced set of data elements.

This is no easy task, nor is it one we can ever really complete. Yet those companies that have made a solid effort to weed their data dictionaries have typically been able to reduce the number of unique data elements in their system from thousands to hundreds. Development time for new applications is greatly reduced. Data translation devices and steps are eliminated, reducing equipment costs and processing times and enhancing information reliability. Postponing this effort will lead to increased overall costs and limit our ability to take advantage of object-oriented techniques.

Having attempted, with some success, to overhaul the corporate data dictionary in two companies, I realize both the enormity of this undertaking and the difficulty in securing the support of senior management and the user groups involved. The value to the company and the benefits to any given user are not as immediate as those of other projects that compete for our time and money.

So when I heard recently that two major companies, both acknowledged leaders in IS, have committed resources to this farsighted task, I was motivated to use this column to applaud their strategic vision. Perhaps the awareness that some companies at the cutting edge of IS are honing their data dictionaries will inspire others to sharpen their saws.

Hopper, former chairman of AMR Corp.'s The Sabre Group, is now principal of the Max D. Hopper Associates consultancy in Dallas.



Introducing WebFORCE from Silicon Graphics. Everyone's clamoring about the World Wide Web. And not just surfing. They're looking to *you* to get your organization's Internet site up and running, as quickly as possible. Posting the most compelling home page on the Web. And serving increasingly media-rich content to the world swiftly, easily, and with security. Thanks to WebFORCE™ systems from Silicon Graphics, you can do all that — right now. See what we mean, once and for all. Stop in at http://www.sgi.com or call 1-800-800-7441,* dept. D401.

THE NEW FORCE IN COMPUTING™

Silicon Graphics™

*Outside the U.S., call (415) 390-2710.

©1995 Silicon Graphics, Inc. Silicon Graphics is a registered trademark, and the Silicon Graphics logo, WebFORCE, and The New Force in Computing are trademarks of Silicon Graphics, Inc. Netscape Communications and Netscape are trademarks of Netscape Communications Corporation.

IBM, Motorola launch new PowerPCs

Low-power, high-performance 603E released

By Jaikumar Vijayan

■ The near total lack of desktop systems based on PowerPC chips — apart from those by Apple Computer, Inc. — has not stopped IBM and Motorola, Inc. from announcing new PowerPC processors.

Last week, both companies released the 100-MHz PowerPC 603E, a low-power, souped-up, higher-performance version of its predecessor, the PowerPC 603.

The processor, which is being aimed mainly at the notebook and portable markets, is also expected to appear in corporate desktop systems from Apple and Firepower Systems, Inc.

IBM has indicated it will use the 603E in its long-promised PowerPC-based desktops and notebooks, which are scheduled to arrive in the second half of this year. In the past, IBM has maintained that it will wait for its OS/2 for the PowerPC to materialize before announcing desktops based on the chip.

At 98 sq. mm., the 603E is slightly larger than the 603 because of on-chip 16K-byte instruction and 16K-byte data caches. According to IBM, typical power dissipation of the 603E is just 3 watts, making it ideal for notebooks, subnotebooks, laptop computers and energy-efficient desktops.

Better pricing

For users, the chip could mean PowerPC-based desktops that retail for roughly $2,500 and energy-efficient portables that cost around $4,000, analysts said.

"It clearly seems to offer better price/performance over the 603," said Linley Gwennap, editor of the "Microprocessor Report" in Sebastopol, Calif.

Otherwise, in most functions, features and capabilities, the 603E mirrors the original PowerPC 601 processor and does not offer greater functionality except in terms of its low cost, power consumption and speed increase from 80 MHz to 100 MHz.

"The announcement of the 603E could signal the fading out of the 601," Gwennap said.

The doubled on-chip cache of the 603E could also mean better x86 emulation and multimedia capabilities, said Dean McCarron, an analyst at Mercury Research, Inc. in Scottsdale, Ariz.

Key features of the 100-MHz PowerPC 603E

3W typical power dissipation: Optimized for portables; extends battery life, reduces heat.
8.40mm x 11.67mm die size: Slightly larger than its predecessor.
On-chip 16K-byte instruction and data caches: Twice the size of the original; results in higher performance.
3.3V power supply: Energy savings.

The potential availability of systems based on this and other PowerPC chips — particularly from IBM — has piqued the interest of users such as Frank Crawford, chief information officer at Edgcomb Metals, Inc. in Bensalem, Pa.

But it will take more than a performance boost to induce users to buy PowerPC-based systems, he said.

"Prices have to come down," said Crawford, who recently purchased Intel Corp. 1486-based systems at half the price he paid for previous-generation 386 systems a few years ago.

"So unless there is a very specific need for the kind of increased performance [the new PowerPC chip offers], we won't buy" until prices come down, he said.

Other users agreed that price was an important consideration.

"If the performance [boost] is available at a reasonable cost, we wouldn't mind buying systems based on the product," said Charles Griffith, MIS coordinator at Albany Junior High School in New York. Otherwise, the purchase will be put off until the next-generation PowerPC 604 is announced, he said.

End-user training

Lotus tool puts a twist on teaching

By William Brandel

Any information systems organization knows the frustrations of having to answer the same questions over and over and the mundanity of training end user after end user to do (or not do) the same tasks on the system.

Lotus Development Corp. has an upgraded product with the potential to eliminate some of these problems. Lotus is preparing to deliver ScreenCam for Windows 2.0, which includes a number of practical improvements over the software's previous rendition (see box).

ScreenCam improvements

- Data compression of up to 90% of file size
- No audio/speaker requirement
- Audio can be edited separately from video
- Enhanced OLE capabilities

ScreenCam is a PC-based multimedia tool that records keystrokes and what is graphically presented on the screen. The recorded "movie" can run on its own, or the user can move through it interactively using a mouse or keystrokes.

Because ScreenCam 2.0 requires fewer resources than the earlier version and eliminates the need for additional multimedia equipment, the product may break out beyond its niche status, said David Yockelson, program director at Meta Group, Inc., a consultancy in Stamford, Conn.

ScreenCam no longer requires speakers or soundboards in the PC to run the movie clip. Users can now write subtitled scripts that can run in lieu of the audio portion of the movie.

Lotus, *page 76*

HP's OmniBook 4000 hits with price

By Jeffrey Gordon Angus

Hewlett-Packard Co.'s latest color offering, the OmniBook 4000, is a full-size notebook with features comparable to IBM's ThinkPad, but it is priced significantly lower.

Most notable are an impressive active-matrix color display and a strong warranty. The system includes 8M bytes of RAM, a 50-MHz 486 processor and a 520M-byte hard drive. It lists for $5,670, with an estimated street price of $5,249. The same configuration with a 100-MHz 486 CPU lists for $6,510, with an estimated street price of $6,099.



Vibrant colors

The OmniBook's 10.4-in diagonal, thin-film transistor, active-matrix color display not only serves up wonderfully rich colors from a range of viewing angles, but it also offers screen update speed comparable to or better than the best desktop displays.

HP includes unlimited toll-free support. In the first year of the three-year worldwide warranty, HP offers a feature called Express Exchange, which means the company will deliver to you a replacement component by 10:30 a.m. the next business day. Unless you buy a special extension (HP Support Pack), the final two years of the warranty involve returning the part to HP for repair.

The OmniBook 4000 line also includes 16-bit SoundBlaster-compatible audio, a built-in microphone, a keyboard trackball, an infrared port for a cable-free network connection and external ports for hooking up the keyboard, mouse or display. You can also add PCMCIA cards: a Type III card or a pair of Type II cards.

OmniBook's keyboard and display are very good, so it is unlikely you will want to add to them. However, most users will need a better pointing device than the OmniBook's built-in trackball and should use the machine's mouse port to add one. The trackball's motion and action are fluid, but its location will slow down nine out of 10 users.

The trackball is located at the center of the keyboard's bottom edge and seems to have been made so as not to inconvenience left-handed folks, but that was done at the cost of making it less convenient for right-handed users.

OmniBook 4000
Hewlett-Packard Co.
Palo Alto, Calif.
(800) 443-1254

▶ HP's first full-size notebook PC, the OmniBook 4000, has a strong chance of being a contender in an intensely competitive market due to HP's success with subnotebooks and the vendor's reputation.

▶ The machine does not open any new technological territory. Its chief strengths are a high-quality screen and an exceptional warranty. It is also priced lower than IBM ThinkPad notebooks that offer comparable features.

The machine is light — less than 8 pounds with the hard drive — compared with other machines in its class. The workmanship seems better than average, although some of the doors that cover the external ports can come off in your hand when you try to open them. You then have to snap them back in with a little finesse.

In work situations, the 50-MHz processor on the system we tested

OmniBook, *page 76*

EXECUTIVE TECHNOLOGY SUMMIT'95



May 3-5
The Pointe at Tapatio Cliffs, Phoenix Arizona

from **SIM International** *&* **Computerworld**

Where top IS executives meet to get answers on:

- **Client/Server Technology**
- **Mobile/Wireless Computing**
- **Next Generation Databases**

For Registration Information, Call:
1-800-SIM-0035

The Summit sponsors are:

3Com — Networks That Go the Distance™
GTE
IBM
LEGENT
Microsoft
Price Waterhouse
PROGRESS SOFTWARE
SEQUENT — Our Business is Your Success
SYBASE — The Enterprise Client/Server Company™

The Summit

48 Hours
Designed by IS executives, for IS executives. Forty-eight hours of the most exclusive technology action of the year. You can't get better information faster.

Practitioners Forum
Get straight talk, from real practitioners. Four provocative sessions of hard-hitting, high-impact interaction. Industry leaders start right into your toughest questions.

Emerging Technologies
William J. Caffey, Vice President, Advance Technology Strategies, The Gartner Group, talks about integrating new technologies into existing applications. He tackles how to assess strategic benefits and justify purchases by bottom-line results.

Solution Labs
Ten interactive labs where you can put leading IT companies and their products through their paces with your peers. Your customized selection of these labs will provide you with opportunities to scrutinize working products on your own terms and come face-to-face with real practitioners who know the cost of making their decisions work.

The Practitioners Forum

Client/Server Computing

Leader:
Howard Anderson, Managing Director, The Yankee Group

Panel:
Steve Brooks, Executive Director of IS, Walt Disney Company

David P. Rodger, Vice President, Corporate Architecture, Sequent Computer Systems, Inc.

Tom Robben, V.P., Application/ Strategic Architect, Core Cash & Security Systems, J.P. Morgan

Clifford Rushton, MIS Director, Federal Paper Board

Client/Server Computing

Leader:
Alan Alper, Editor, *Computerworld, Client/Server Journal*

Panel:
Tsvi Gal, Senior Vice President, Client/Server Systems, Bank of America

Robert Yellin, Chief Technology Officer, Legent Corporation

William Zeitz, President, Zeitz & Associates

Mobile/Wireless Computing

Leader:
Andrew M. Seybold, Editor-in-chief, *The Outlook on Mobile & Professional Computing*

Panel:
Enrique Crespo, Manager of Corporate Sales Systems, The Torrington Company

Chuck Parrish, General Manager, Mobile Data, GTE

Mike Radigan, Program Manager, USCO market-to-collections, Xerox Corporation

Sandy Sully, Vice President of MIS, 3Com Corporation

Next Generation Databases

Leader:
Richard Finkelstein, President, Performance Computing

Panel:
Michael Abbey, Database Administrator, Auditor General's Office of Canada

Ronald S. Elkin, Program Manager, Battelle Memorial Institute



A D V A N T A G E



UNIX FOR BUSINESS-CRITICAL SOLUTIONS

SPECIAL ADVERTISING SUPPLEMENT

SUN IS #1 IN UNIX WORLDWIDE.

WHY SHOULD YOU CARE?

For those of you who are looking for the only operating system that delivers the true benefits of open client-server computing, first the facts. Sun ships more UNIX systems worldwide than anyone. Not surprisingly, Sun is also the leading UNIX platform for relational database software. In fact, Solaris, Sun's UNIX operating environment, is the world's leading volume UNIX operating system.*

Now that you know the facts, the figures should prove especially meaningful. Consider that being number one means we have more than 16,000 UNIX experts to ensure that your business-critical systems are always up and running. More than 9,000 UNIX applications. And more UNIX know-how than any of our competitors. So why should you care? Because being number one means that when it comes to UNIX, nobody has more to offer you than Sun.

Sun

The Network Is The Computer™

*Source: International Data Corporation. 1995 Sun Microsystems, Inc. All Rights Reserved. Sun, the Sun logo, Sun Microsystems and Solaris are trademarks of Sun Microsystems, Inc. UNIX is a registered trademark in the U.S. and other countries, exclusively licensed through X/Open Company, Ltd. All other products or service names mentioned herein are trademarks of their respective owners.

Unix



the Client/Server Advantage

The demand for Unix systems and software is skyrocketing. Today, more business software runs on Unix than any other operating system. Why? Because Unix is the one platform that merges the key benefits businesses need from their computing environments: power, scalability, expandability, and distributed computing capabilities. In a word, it delivers flexibility.

Unix is an open environment; able to run on virtually any type of computer because it can run on many processors, including SPARC, Intel, and Motorola. Unix works with both legacy and new technologies. It also offers power, multitasking, multiprocessing, and multithreading capabilities for fast system response times. With more than 25 years of development and refinement, Unix offers the reliability, availability, and security features users and system administrators require. And because it allows for distributed computing, Unix has become the foundation for client/server computing, a new paradigm that gives businesses the flexibility to quickly develop and deploy new applications, and move information and computing power to exactly where it's needed.

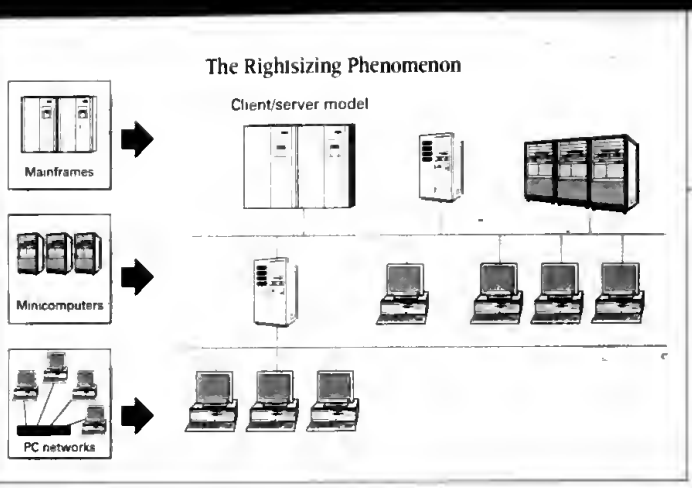
These factors, combined with increasing price/performance, have made Unix the key enabling technology for business process reengineering (BPR) or rightsizing. Unix allows organizations to build an enterprise information system that fits the company's business practices rather than the other way around. By implementing Unix-based technologies on an enterprise-wide scale, businesses can give users faster access to more information while lowering operations costs.

Relying on Unix for Business-Critical Applications

With millions of business users around the world, Unix has clearly proven its power and reliability. Business-critical applications are especially well-suited to Unix because they're network-dependent.

Unix was built for mixed-vendor networking, and allows businesses to tie together their vast computing resources, integrating the personal productivity applications of PCs with corporate data center applications and other massive computing concentrations.

In recent years, Unix system vendors have worked



Unix & the Client/Server Advantage

continued

to make Unix an even more appealing environment for business-critical computing.

Sun Microsystems, for example, has been an active participant in a number of key standards organizations charged with creating consistent, permanent standards for Unix system interoperability, portability, and manageability.

Sun has also focused on streamlining support for customers with heterogeneous environments — inherent to all vendors of open systems — to eliminate the need to coordinate with multiple vendors. Sun's strong partnership approach with third party hardware, software, and networking suppliers allows customers to maintain multiple supplier relationships through one vendor.

Many companies around the world have seen the advantages of Unix for business-critical applications first-hand. At GM Hughes Electronics' Space and Communications Company, Chief IT Technologist, Steve Hagerth, views client/server technology as a way to connect business processes and leverage the information flow through the organization. "Part of our goal in using Unix based systems is to treat our business as an integrated process, and to look for ways that IT can support that process." Hughes Space and Communications has embarked on an ambitious plan to connect its marketing, engineering, and manufacturing processes through the use of client/server business solutions. Their implementation efforts include a Product Data Management system for managing engineering data, including CAD drawings, while maintaining tight control of spacecraft configurations. They are also implementing new client/server systems for proposal development and manufacturing requirements planning.

In the past, GM Hughes used a variety of incompatible systems for each aspect of its business, which sometimes meant the company couldn't access available information. The company's new client/server architecture integrates this information, and is driving key decision-support systems that have already improved the company's bottom line.

Hagerth adds, "Sun's support for key standards like X.11 and DCE made their platforms much more attractive to us, because we want all of our systems to interoperate. Support for open systems, and meaningful standards, is one of the things we like best about Sun's approach to system development."

In an age where the fast, seamless, and secure flow of information to individuals and organizations outside the company has become almost as critical as business applications, Internet access is now a key consideration. And many Internet access providers, both large and small, have found that Sun offers a strong mix of Internet client services and the ability to handle numerous user connections.

As Smoot Carl-Mitchell, President of Zilker Internet Park, an Internet access provider in Austin, Texas puts it: "We had lots of choices for our server platform. Nothing else compares to Sun for the combination of value and reliability that lets us deliver the services our customers expect at a price they can afford." And as its business has grown, Zilker's Sun platform has grown with it, easily accommodating more connections, processing power, and disk space.

Today, 56% of all Internet servers around the world are Sun systems. Even other computer vendors, such as Apple Computer, use Sun hardware to provide access to their own Internet home pages and FTP volumes.

Making the Move: Data Center to Client/Server

Unix computers now have the raw horsepower to enable peer-to-peer communication between clients and servers so that it is now technologically feasible for each to communicate an equal amount of data to one another. The master/slave relationship of mainframes to clients can now be replaced by an environment where servers can manage shared data and expensive peripherals, and clients can manage individual data and inexpensive, personal peripherals. This dramatically reduces costs and increases efficiency compared to mainframe environments.

And with the growing acceptance of rightsizing as a paradigm, we are already seeing the influx of high-quality applications that are specifically designed to take advan-

tage of distributed environments.

Many companies have increased competitiveness and customer service while simultaneously cutting costs through client/server computing. Sun itself is perhaps one of the best examples.

In the late 1980s, Sun ran most of its core business operations on mainframes. The mainframes became overloaded as a result of the company's rapid growth, and Sun's CIO recommended purchasing more mainframes. Scott McNealy, Sun's chairman and CEO, objected strongly. It made no sense to him that Sun should purchase equipment from other vendors to run its business when it sold the industry's most powerful server hardware. In 1989, he drew the proverbial line in the sand, saying "Read my lips. No new mainframes."



Over the past five years, the transition from the mainframe-dominated data center to client/server computing has occurred. And integrating new Unix applications with existing mainframe systems seems to have improved business. For starters, Sun has realized savings of about $2 million per year by avoiding mainframe hardware and software maintenance upgrades. Overall system response time has improved for users because Sun's computers are being used for the tasks they handle best rather than whatever task is at hand. Sun's inventory turns have reached 10 per year since the migration, and the average quote-to-collect time has dropped to 100 days from 257 days.

Moreover, Sun has learned a great deal through its own rightsizing effort — not only about optimizing the technologies and methodologies for making the move to client/server computing, but also about the real-world challenges rightsizing presents for customers.

Many kinds of companies are realizing the benefits of client/server computing. Interactive Transaction Partners (ITP), a new partnership between EDS, France Telecom, and U S WEST, devoted to the delivery of interactive transaction services to financial institutions, retailers, and billing service companies, is moving transaction data from a Tandem mainframe to a Sun-based client/server platform.

EDS supports over 8,000 ATM systems, over 500 banks that handle transactions for smaller banks, and thousands of branch banking facilities nationwide. ITP has built in connectivity to those systems. Dan Twing, Director of Product Management for ITP, said that ITP wanted to store 18 months of transactions online so the company could handle customer queries any time. "We needed an affordable system with large capacity, excellent transaction handling capabilities, and strong communications capabilities. For us, Sun's client/server solution has been an excellent choice."

LDDS Communications, Inc., the fourth-largest long distance carrier in the United States, is another sizable organization with a major data center application. In addition to running its billing and logging operations on three Sun SPARCcenter 2000 servers, LDDS also runs a proprietary fraud prevention and analysis application on two or more SPARCcenter 2000 servers. This application monitors incoming calls in real time, including both calling-card-based and operator-assisted calls, analyzing them for potential fraud.

Terry Nelms, Manager of Systems Integrity for LDDS, explains why this application is critical to the company. "We process tens of thousands of calls per minute and have kept our fraud-related costs to one of the industry's lowest. Left unchecked, fraud could have cost the company tens to hundreds of thousands of dollars every hour."

Summary

While the benefits of Unix for client/server computing and rightsizing applications can be enormous, the transition process from legacy environments can be complex and challenging.

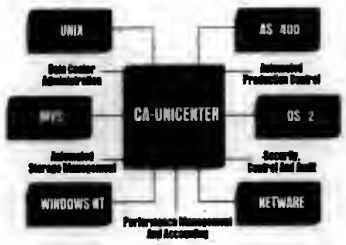
For Sun and its customers, the real value of client/server technology comes from linking people, data, and processes together to create a smooth flow of information. Unix, designed for power, scalability, and distributability, provides the ideal foundation for enterprise-wide client/server computing. And Sun offers a unique combination of real-world, hands-on knowledge, and leading-edge technology that enables organizations of any size to build and optimize a client/server environment.

We hope this and the other accompanying articles will provide you with fresh insights, information, and advice for successfully migrating and managing systems on an enterprise network, and integrating PCs into enterprise client/server environments. ◆

Presenting The 7
Of Systems Mana



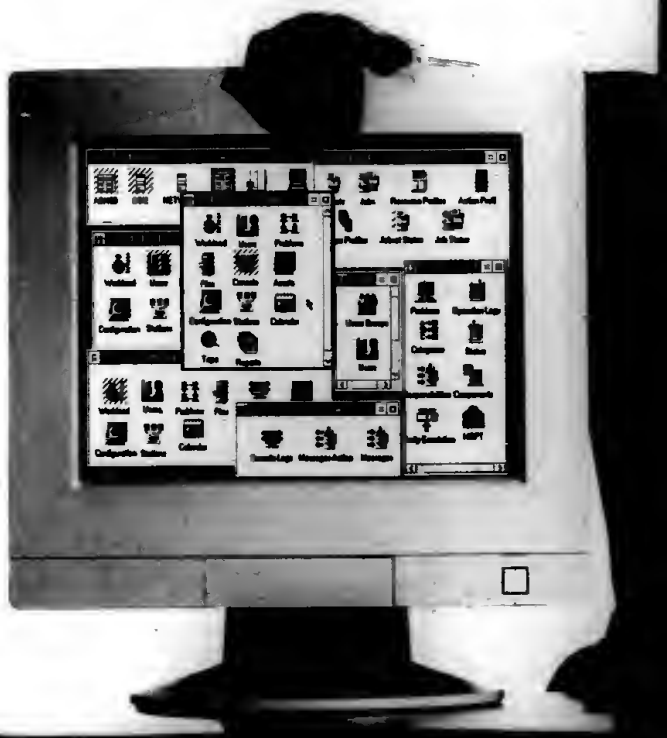
1 Replace Disperate Point Products With A Single, Integrated, Comprehensive Solution.



2 Choose A Client/Server Application That's Interoperable, Scalable and Portable.

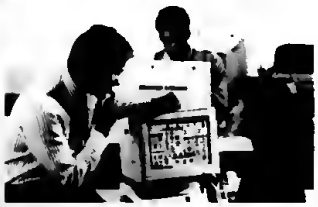
3 Demand An Open Solution That Supports All Key Industry Standards And Protocols.



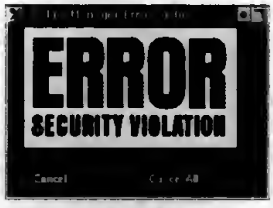


COMPUTER ASSOCIATES
Software superior by design.

Commandments gement Software.

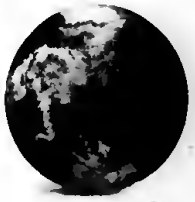


4 Standardize On A Common GUI Interface That Makes It Easier To Use. Reduce Training Costs And Boost Productivity.



7 Protect All Your Data With Bulletproof Security Software That Supports Every Platform And Operating System Across Your Entire Enterprise.

5 Partner With The World's Leading Software Company.



6 Leverage Your Systems Management Experience, Expertise And Personnel.





When choosing your systems management software, you shouldn't have to make a leap of faith. And with new CA-Unicenter,* you don't have to. Because CA-Unicenter is the single, integrated systems management solution that solves all of the challenges of managing client/server computing across heterogeneous platforms.

So call today for more information about the systems management software you can believe in: CA-Unicenter.

Call 1-800-225-5224 Dept. 10163 For More Information And To Register For The CA-Unicenter Software Giveaway.

CA-Unicenter®

Integrated Client/Server Systems Management Software

* Computer Associates International, Inc., Islandia, NY 11788-7000. Offer good in U.S. and Canada only. All other product names referenced herein are trademarks of their respective companies. Requirements for Software Giveaway available through toll-free number.

BY SCOTT McNEALY

A New Support Paradigm For the Enterprise Customer

The ongoing revolution in networking, and open, client/server systems, is making enterprise-wide computing environments more powerful, functional, and diverse than ever before. The good news is that networked open systems deliver more capabilities to the user than did the old, single-vendor proprietary computing paradigm. The bad news is that heterogeneous networks place a whole new set of demands on those responsible for implementation and support.



SCOTT McNEALY

Enterprise-wide networks are often a patchwork of client/server systems, PC LANs, older mainframes and minis, assorted third-party peripherals, and software. The new support paradigm embraces this heterogeneity and addresses three key expertise-related requirements: technology expertise, service partnerships, and problem ownership.

Technology Expertise

Core technology expertise is central to the new support paradigm. Sun Microsystems is one of the founders of open computing and is fully committed to it — one hundred percent of Sun's revenues comes from open, Unix computing as compared to less than 40 percent of revenues for leading competitors. Sun is also the largest supporter of open, Unix client/server computing, with more than 500,000 systems supported. The company's open systems experts span the project life cycle, from IT consultants who help minimize downstream risk, to program managers who deliver complex integration products on time, and within budget, to system support engineers who provide open system support, to operations professionals who ensure a smooth and efficient running operation.

Customers recognize Sun's leadership in open, client/server support, and as a result, Sun is the world's leading Unix client/server education organization, training more than 50,000 students annually.

Partnership Expertise

In today's heterogeneous enterprise-wide networks, no one vendor has all the expertise. Instead, the primary support provider must work in concert with other vendors to solve a customer's problem. Service partnerships with other vendors are essential. Sun is one of the industry's leaders in the use of partnerships and alliances to deliver products and comprehensive service. Today, Sun has more than 17,500 service employees and service partners who solve complex customer problems in heterogeneous multivendor environments.

Problem Ownership Expertise

The final and critical component of the new support paradigm is the ability to assume ownership of the customer's problem. In developing solutions, Sun accepts this responsibility, providing program management which takes ownership for the platform including hardware, software, and middleware.

In system support, the SunSpectrum Platinum and Gold programs, for instance, offer 24-by-7 telephone support, on-site assistance and Personal "Ambassadors" dedicated to specific customer accounts. In these accounts, Sun works closely with other vendors to take ownership of problems, avoiding the finger-pointing that often plagues heterogeneous installations.

As corporate computing becomes increasingly heterogeneous, Sun will continue to invest in technology, partnerships, and problem ownership to ensure that our enterprise customers get nothing but the best in expertise and support.

Scott McNealy is chairman and CEO of Sun Microsystems, Inc. ◆

WORKING TOGETHER

TO BRIDGE OPEN SYSTEMS.



For too long 'open' was more of an idea than a reality. That's why the two UNIX leaders, Sun and Oracle, with 38% and 44% of their respective UNIX markets (IDC), formed dedicated cooperating teams of engineers and field consultants to ensure optimal performance of our integrated, open solutions. Both companies also make extensive use of each other's emerging technologies in running our businesses — a combined beta site of over 22,000 employees. No solution goes to market that we wouldn't rely on ourselves. For a copy of the 'Oracle for Sun - Working Together' color brochure, call:

1-800-633-1071 Ext. 8160.

ORACLE

Sun

Creating Competitive Advantage Through IT Architecture

Information is opportunity. When the right information is available to the right person at the right time, your business wins. The challenge is to deliver as many wins as possible, as soon as possible, while controlling the cost of information technology (IT). The problem is that IS professionals are working with a moving target: factors such as globalization and competition are constantly changing the business environment, and business managers' ideas about how to cope, change accordingly. Adding to the challenge, technology itself is in a continual state of flux.

How can you respond to rapid change efficiently and effectively to rack up wins without racking up huge bills or disrupting business operations? Maximum flexibility and responsiveness can only be achieved by adhering to a well-defined architectural framework.

IT architecture is the ultimate weapon in controlling cost and responding to change.

Sun Microsystems has developed an effective, practical framework for defining corporate IT architecture within the client/server world based on Sun's experience helping forward-thinking companies migrate to open, distributed computing. It's also the framework that Sun itself has used to make its own internal migration to a Unix-based client/server network environment.

Rules for IT Architecture

Like an earthquake-proof building, IT must accommodate movement without sacrificing structural integrity.

IT architecture is supported by five essential "pillars":

- Network. The physical and logical infrastructure that supports the distribution and processing of data throughout the enterprise.
- Data. The raw content upon whose integrity and availability effective corporate computing depends.
- Applications. The means by which users gain access to data so that speed, quality, and cost-effectiveness are optimized.
- Development. The discipline under which applications are designed and implemented for maximum return-on-investment.
- Middleware. The toolset that ensures component technologies are both interoperable and independent, enabling fully modular, and therefore highly adaptive, IT architecture.

For these pillars to support business processes, they must rest on an unshakable foundation of open industry standards coupled with the organization's own architectural IT framework. In this way a tremor in one section will not adversely affect the entire structure. Architectural standards protect investments, increase productivity, and enhance manageability — even in the face of complexity. Simply put, IT architecture is the ultimate weapon in controlling cost and responding to change.

The IT Blueprint

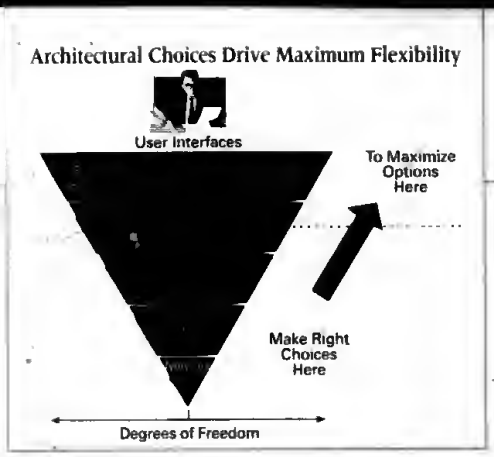
The rightsizing successes Sun has produced, both internally and for global customers, has led to the development of the following guidelines for maximizing the value of the IT infrastructure:

Network Architecture

For high accessibility and true location independence, the network must act as a single, seamless processing resource. The wide range of services required on the network — applications support, messaging, remote and mobile access, Internet access, multimedia, etc. — place a tremendous burden on the computing infrastructure and those who manage it. Yet, IT budgets dictate that administrative costs not scale up with size and complexity.

To cope with this burden, strict standards for the enterprise network must be defined. What's more, by implementing specific standards at the network level, greater flexibility is available at the middleware and application level. (See Figure.)

A well-thought-out transition strategy also ensures a successful migration to next-generation technologies: ATM, integrated voice/data/video, IETF-compliant routers, and virtual IP network services. IT professionals need to build partnerships with vendors who possess both technical depth and real-world experience to develop an effective game plan for this transition.



Data Architecture

Traditional data modeling often slows down the development process because the model is tied to, and dependent on, a particular application and therefore also becomes susceptible to obsolescence. A more strategic alternative is to use a data modeling methodology that creates enterprise data repositories based on consistent, standardized data types. While some transactional data may remain application-specific, unique global identifiers for customers and products should apply across all applications, enabling consistent and accurate roll-ups. Such standardization also enhances manageability and scalability.

Application Architecture

Though a two-tiered client/server architecture is an improvement over the previous mainframe-centric model, it is still limited. For maximum flexibility and rapid adaptation to changing business conditions, companies must begin standardizing on a three-tier architecture that fully decouples data, business logic, and the user interface.

A standard means for applications to communicate with each other must also be developed. Writing unique links between each and every application on the network creates a tremendous maintenance burden and seriously limits extensibility. The solution: a robust "publish-and-subscribe" architecture. Recently endorsed by Sun CEO Scott McNealy, this kind of model enables self-describing objects to be shared freely among applications, without juggling a multiplicity of vendor-specific APIs. It creates a scalable, flexible, and highly manageable environment for inter-application communications that enables more rapid development and deployment. The result is an "application highway" that allows for seamless communication between business processes without burdensome programming and data formatting tasks.

Development Architecture

In order to ensure that the real needs of business users are being met, the traditional "waterfall" approach to software development should be abandoned and replaced with time-compressed, iterative techniques. Sun's Rapid Application Development and Deployment (RADD) methodology brings end users and process owners into the cross-functional team, allowing all stakeholders to pro-actively communicate with each other. This approach allows changes to be incorporated in real time, instead of forcing developers to start over each time a modification is required. Incorporating end-user stakeholders into the process is also a key factor in the effectiveness of any IT solution.

Middleware Architecture

Middleware is an indispensable set of software components layered between applications, operating systems, and network transports. Transparent, cross-platform processing depends on the effective use of middleware products to enable communications across the application highway. Middleware components include directory services, message-passing mechanisms, distributed transaction processing monitors, object request brokers, and remote procedure call (RPC) services. By implementing the right middleware components consistently throughout the enterprise, business process owners gain a large degree of flexibility, without threatening long-term investments in IT infrastructure.

Beyond Paper Guidelines

Simply defining architectural requirements in a manual won't accomplish the mission ahead for IT. It's people and practices that make standards realities. This is especially true as IT responsibilities are dispersed and distributed. Sun's experience in rightsizing also shows that, in addition to training on tools and technologies, it is essential for IT organizations to learn the additional architectural, project management, and team interaction skills that make or break the transition process.

Companies must begin standardizing on a three-tier architecture that fully decouples data, business logic, and the user interface.

By partnering with Sun, corporate IT managers can expedite this critical transfer of expertise, while satisfying immediate needs for technical services and support.

The benefits of building an open, flexible IT architecture are worth the investment. As Sun has proven time and again, with appropriate technical standardization, disciplined operations and an empowered staff, IT can deliver better solutions, faster. And that means bigger wins at less cost. ◆

BY EDWARD ZANDER

Integrating PCs Into the Enterprise:

TIPS FOR EXECUTIVES

Only a short time ago, two different worlds of computing existed: the desktop PC and the enterprise network. Today, people are demanding the best of both worlds.

Sun Microsystems has been a leader in integrating PCs into open, client/server environments for many years. Here's a quick checklist to consider when determining the best way to integrate PCs into the enterprise.



EDWARD ZANDER

Avoid Either/Or Decisions

You should never have to choose between legacy systems and new technology as you integrate PCs into the enterprise. Technology can connect virtually any standalone PC or PC LAN into enterprise networks without losing functionality. New and existing Sun products enable PCs to seamlessly integrate from mixed environments — such as NetWare, Lan Manager, AppleTalk, and TCP/IP — into the enterprise.

You also shouldn't have to bet your business on a single LAN protocol. Vendors that adhere to industry standards allow users to keep their options open. For example, Sun's SolarNet family of PC networking products for connectivity, integration, and administration, supports both clients and servers — regardless of the communications protocols — in order to avoid switching when integrating PCs with the enterprise network. The protocol-independence of SolarNet products means PC users can integrate into a powerful new array of network resources and services without changing the way they work.

Make Sure the New Environment is Manageable

Conventional wisdom holds that technology gets less expensive every year. The reality is that while the cost of hardware usually decreases, the total cost of administration and management increases. Make sure that the LAN integration solution you implement offers effective, cost-efficient administration and management tools. A few questions to consider when weighing your options:

- How easy is installation and configuration of networking software for PC clients?
- What does the solution offer to simplify the tasks of adding, changing, deleting, or relocating user data?
- Is there an easy, efficient way to configure users or groups of users to share file systems and printers?
- Can you manage decentralized PCs and resources from a central site?

Sun's approach offers an integrated set of administration and management tools: a data repository for configuration information; a communications pipeline between TCP/IP and Windows clients and the administrative functions; network protocols that deliver configuration information from the workgroup server to PC clients; mechanisms for sharing network resources across the enterprise; and easy-to-use network management tools that allow heterogeneous systems to be monitored.

Insist on a Scalable, Distributable Solution

Clearly, the backbone operating environment in an enterprise network has to be powerful enough to accommodate multiple users performing multiple tasks concurrently. But as an organization grows, and more PCs

Free Industry Reports!

"**Sybase** And **Oracle** Lack The Clarity of **Informix's** Architecture. They're Going To Have To Go Back to Their Labs."

Parallel Database Technology That's As Dynamic As Your Organization.

Recently, Informix Software introduced Dynamic Scalable Architecture™, a next-generation database architecture designed to take advantage of parallel processing. The result is a technological breakthrough in client/server database performance and scalability. Informix's Dynamic Scalable Architecture will run on the entire range of new, high-performance open systems, from uniprocessors to symmetric multiprocessors, loosely coupled clusters, and massively parallel machines.

John Morrell, International Data Corporation:
"The Informix Dynamic Scalable Architecture has the potential to vault Informix past its primary competitors for high-end database processing functionality."

David McGovaran, Alternative Technologies:
"The new Informix database server architecture will put the vendor ahead of competitors Oracle and Sybase in support of multiprocessing systems."

Rob Thelemeier, Meta Group:
"Informix may have the best scalable server technology today...I think people are mistaken in not taking the time to really look at Informix."

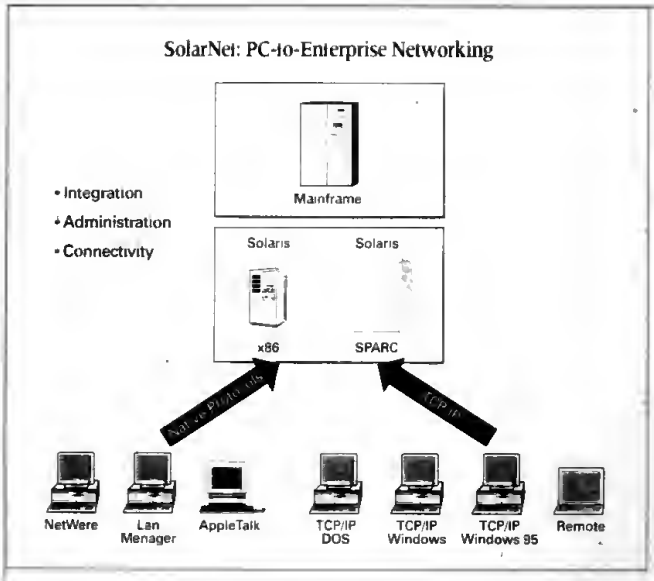
Gordon Kerr, VP, Information Systems, Hyatt Hotels and Resorts:
"What Informix has done with DSA is make it much easier for me to plan for the future. We're beginning to deploy symmetric multiprocessing hardware through our organization, and I know that if and when we determine we need to scale up to loosely coupled or MPP machines, our Informix applications will be able to make the move with us."

Michael Bloomberg, Bloomberg Financial Markets:
"Informix developed core internal parallelism in DSA, which is different than other types of add-on parallel database capabilities we've seen. Since the parallel processing features are internal, rather than external, we're expecting impressive performance gains. It's clear that Informix thought this technology through."

Find Out Why DSA is So Different.
We'd like to tell you more about Informix's Dynamic Scalable Architecture, including an independent report from the Aberdeen Group. **Send or call toll-free 1-800-688-IFMX, ext. 18 for your free copy.**

INFORMIX®

© 1994 Informix Software, Inc. Informix is a registered trademark of Informix Software, Inc.
All other names indicated by ® or ™ are registered trademarks or trademarks of their respective owners.



Integrating PCs Into The Enterprise ... continued

and PC LANs are connected to the enterprise network, how do you keep the system from bogging down?

The answer is through a scalable, distributable operating environment that maximizes hardware investments while leaving room to grow. The Solaris operating environment from SunSoft is an excellent backbone environment for PC integration because it provides maximum flexibility. It runs on a wide range of hardware platforms including x86, SPARC, and soon PowerPC and supports multiprocessor servers and multithreaded applications.

As PCs and PC LANs are connected to the network, how do you keep the enterprise from bogging down?

Check Under the Hood for Reliability

Data integrity and system availability are critical requirements at most companies today — not just for high-end servers and mainframes, but also for PCs. When weighing the pros and cons of various PC integration alternatives, make sure you fully understand how PC reliability is maintained in a network environment.

Sun provides reliability through an extensive array of advanced features specifically designed for heterogeneous networks. For example, Sun tools and technologies let you:

• Back up and centrally manage data from heterogeneous PCs, lowering total administration and maintenance costs.

• Add to the robustness and high data availability of replicated sites through disk mirroring and "hot spares," ensuring full, automatic and transparent recoveries from disk crashes.

• Automatically update daily transaction records and replicate them to remote locations.

Don't Give Service Considerations Short Shrift

Until recently, it was easier to take service for granted. Unfortunately, many companies have discovered that high-quality service doesn't always come with high-technology products. Before selecting a technology vendor, ask a few pointed questions about the level and quality of their service offerings:

• Does the company's problem-resolution system provide timely answers, and is it accessible and reasonably easy to use?

• Beyond repairing and replacing defective components, can the company offer a wide spectrum of consulting services to assist its customers?

• Does the company employ dedicated service technicians, and can it leverage third-party expertise?

• What's the level of expertise of the service representatives who will support you?

• Does the company offer global service capabilities and facilities?

Enter the Internet from a Central Location

A key reason most companies are interested in integrating PCs into enterprise networks is to promote a free-flow of critical information throughout the organization. The Internet facilitates this effort by allowing users to communicate with other companies and customers quickly and easily.

Many on-ramps exist to the Internet, and many vendors are willing to help you get online. If you want to keep IS and administration costs in line when connecting your business to the Internet, you need to establish a

centralized location for PC users to access Internet resources. Sun's products help administrators automate configuration while providing a simple-to-use interface for adding Internet mail users, thus significantly reducing deployment costs.

Security considerations are vital with the Internet since it is not owned or controlled by anyone, and has no built-in security mechanism. Select a vendor that has experience with Internet security and state-of-the-art security products.

Ask for the Client List

Many companies will claim to offer the perfect PC integration solution, but very few have the proven technology and expertise to assist on an enterprise scale. How do you separate the real from the hype? Start by asking for business references. Companies that offer true, tested solutions will have no problem with that — and you may pick up some valuable advice that's applicable to your situation.

As for Sun, we're proud to say that more than one million PC users access network resources through our products. That makes us the leading vendor of PC integration solutions; and our long track record of success with international clients makes us one of the world's leading PC-to-enterprise integrators.

Security considerations are vital with the Internet.

Eduard Zander is president and general manager of Sun Microsystems Computer Company. ◆

Client/Server: Beyond PC LANs

By Jim Brennan

Current PC LAN-based operating systems cannot provide the power, features, and functions that established Unix systems are capable of in today's distributed, client/server world.

The multitasking, networking services, and multithreading capabilities of today's Unix systems offer a design with relatively no upper-end execution or memory limits based on the ability to add network elements as needed. In addition, a gradual systematic upgrading strategy protects a customer's investment and avoids the costly step changes often incurred by other operating systems.

Unix provides experience and functionality in mission-critical business applications utilizing 7-by-24 service, and a heterogeneous environment which accommodates multiple protocols and supports multivendor distributed services in a plug-and-play manner by providing a well-defined set of interfaces and services.

Unix Meets Demand

Customers have demanded network-based file systems which typically reside on one system and are accessed by other systems via the network. Unix systems were designed for distributed, networked computing, unlike PCs.

Another primary driving force in client/server solutions is the need to preserve legacy mainframe-critical applications. Implementing major changes to these applications is a challenge because of the difficulty in modifying them and the possibility of introducing bugs and mistakes. A viable alternative is to move new or less critical applications to a high-performance/low-cost midrange server which offers platforms with the requisite price/performance characteristics. PC LANs don't have the functionality or price/performance capabilities to compete.

Evolving client/server networks deliver faster development, increased application capabilities at lower costs, and faster end-user response than mainframes or PCs. Companies wanting to quickly and cost-effectively respond to changing business conditions need to closely examine Unix offerings rather than the less effective PC solution.

Brennan is Senior Director Syndicated Services for WorkGroup Technologies, Inc., a consulting firm based in Hampton, NH.

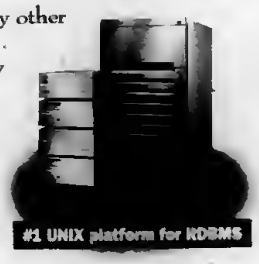


IT'S NICE TO KNOW HE'S IN GOOD COMPANY.

A radical redesign of your enterprise information system was a tough decision. But every now and then you're presented with an easy choice.

THIS MIS MANAGER JUST MADE THE BIGGEST DECISION OF HIS CAREER.

Whether you're building networked applications from scratch or simply offloading your database from the mainframe, Sun offers the best UNIX® platform for RDBMS. More relational database software, including ORACLE, INFORMIX, Sybase, and Ingres, is sold on Sun® systems than on any other UNIX platform. Our servers allow you to interoperate with your existing mainframe and PCs, and expand incrementally as your organization grows. Call 1 800-786-0785, ext. 105 for a copy of IDC's white paper, "Sun Servers in the Enterprise." You'll see why more people choose Sun to make the tough decisions easier.



Sun

The Network Is The Computer.™

©1995 Sun Microsystems, Inc.

BY LAWRENCE HAMBLY

Migration Strategies That Work

A gut wrenching ordeal. A high stakes gamble. That's how migrating from a mainframe environment to client/server computing is often portrayed. But to real-world businesses, the reality of the process is far less dramatic than the myth.

Creating a migration strategy requires systematically identifying, prioritizing, and analyzing business issues and opportunities, and a great deal of time and expert assistance is required.



LAWRENCE HAMBLY

SunIntegration Services, a systems integration and enterprise client/server computing organization, has developed a successful framework for analyzing the business issues and making the tough decisions required for a transition to client/server.

Decision One:
Maintain or Migrate?

It's important to recognize that migration need not be a go/no go decision. A wide range of migration options are available. Begin by determining the level of urgency for migrating individual applications. Some applications work fine as they are while other applications need a complete overhaul. The figure demonstrates how applications can be sorted in terms of their adequacy in meeting current business goals.

The x-axis evaluates how well the application currently fulfills its function in the business process. The y-axis rates its operational quality in terms of cost, technological stability, dependencies, and other factors. We recommend that users begin by plotting the applications that have the greatest impact on the business.

Once key applications are plotted, determine the most appropriate migration option for any given application. Applications that fall in the upper left quadrant are meeting business process needs and are of high operational quality; they probably should be maintained as they are. Applications in the upper right quadrant have high quality but are not meeting business process needs; they should be enhanced but not migrated.

Applications that fall in the lower quadrants are the best candidates for migration to client/server. If they are meeting business process needs but low in operation quality (lower left quadrant), it's probably time to move them to a new environment. If they're low on quality and functionality (lower right quadrant), consider overhauling them.

Decision Two:
What Form of Migration?

The next step is to decide how to migrate the applications chosen for migration or overhaul. There are five basic categories of options:

Refront

Many legacy applications have excellent functionality but are not user-friendly. Refronting, or adding a more aesthetic interface to an existing application without changing the functionality, is an option. Users will have easier access to data and will produce decision support reports faster and easier. This approach is low-cost and low-risk; current operations continue so that mission-critical operations aren't jeopardized. However, this is usually a short-term solution with limited benefits.

Replace

Under this approach, a generic and often complex legacy application is quickly replaced by an off-the-shelf packaged application that runs on a new client/server platform. When contemplating replacement strategies, look for packages that offer better functionality and robustness than existing applications; make sure it is well tested in the marketplace, and verify that it is configurable, enhanceable, and well supported by the vendor.

Like refronting, replacing is a quick, low-risk solution. However, the potential for problems increases



Signaling the Next Generation of EDI

Sometimes, elements that work well independently work even better together. Separately, each signal flag represents a word or concept. Together, they communicate an internationally recognized message.

EDI today, messaging tomorrow. The demand for you to exchange more information, more efficiently is growing. Email, faxes, CAD/CAM, images, workflow, EDI, the Internet...And a critical factor is the link to application software. Sterling Software provides complete EDI application integration through partnerships with industry leaders such as Dun & Bradstreet Software, Oracle, SAP, and others.

Businesses around the world look to Sterling Software as their partner in electronic commerce and integrated messaging strategies. As the world's largest provider of electronic commerce solutions, Sterling offers a complete suite of products and implementation services for all platforms, including UNIX client/server solutions from Sun Microsystems.

Call us today at **1-800-299-4041.**

EDI Software • Network Services • Education • Client Services

STERLING SOFTWARE

Migration Strategies ...

because business processes must conform to the capabilities of the application rather than the other way around.

Rehost

Rehosting involves porting complete applications from a legacy environment to client/server with no change in functionality. Rehosting offers the advantage of low development risk and enables familiar legacy applications to be quickly transferred to a more cost-effective platform.

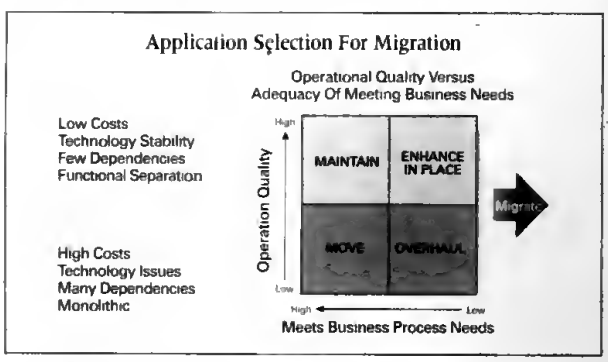
Extensive re-training of users is not needed since the architecture, interface, and functionality do not change. Rehosting is an excellent approach for companies that want to decrease their IS maintenance and support costs by moving to client/server.

The downside of rehosting is that it is, by definition, a quick fix. Rehosting does not change the application or the architecture, so it does not take full advantage of the new client/server technology.

Rebuild

Rebuilding is a tailored approach that enables the entire application architecture to migrate to client/server computing. Applications must be developed from scratch on a new platform so organizations have the opportunity to significantly improve functionality thereby taking advantage of the full potential of client/server environments.

Applications poor in operational quality and functionality are the best candidates for rebuilding. Rebuilding is a good option when time is not a major factor and the IS staff is talented and innovative. The only downside is that new or additional training of users and technical staff is usually required.



Redesign

Companies that need a dramatic improvement in competitiveness may wish to consider redesigning, an approach that attacks the roots of inefficiencies in business practices. Redesigning calls for reengineering the business process at the same time the legacy application is rebuilt, requiring fundamental business and IT changes.

Redesigning takes more time and carries more risk than other approaches and involves significant investments in time, technology, and training. However, it can be the optimal solution for increasing competitiveness.

Identify the Tools and Resources Needed

The technology choices when migrating to client/server computing are numerous. Many vendors offer specialty products and tools for specific platforms, along with myriad consulting and systems integration services. The challenge is not locating viable options; it's narrowing them down.

The first step is to assess how the IS staff's mainframe disciplines translate to client/server skills since new skills are required. Staff requirements should be projected for additional technical skills, project management skills, and rapid prototyping skills.

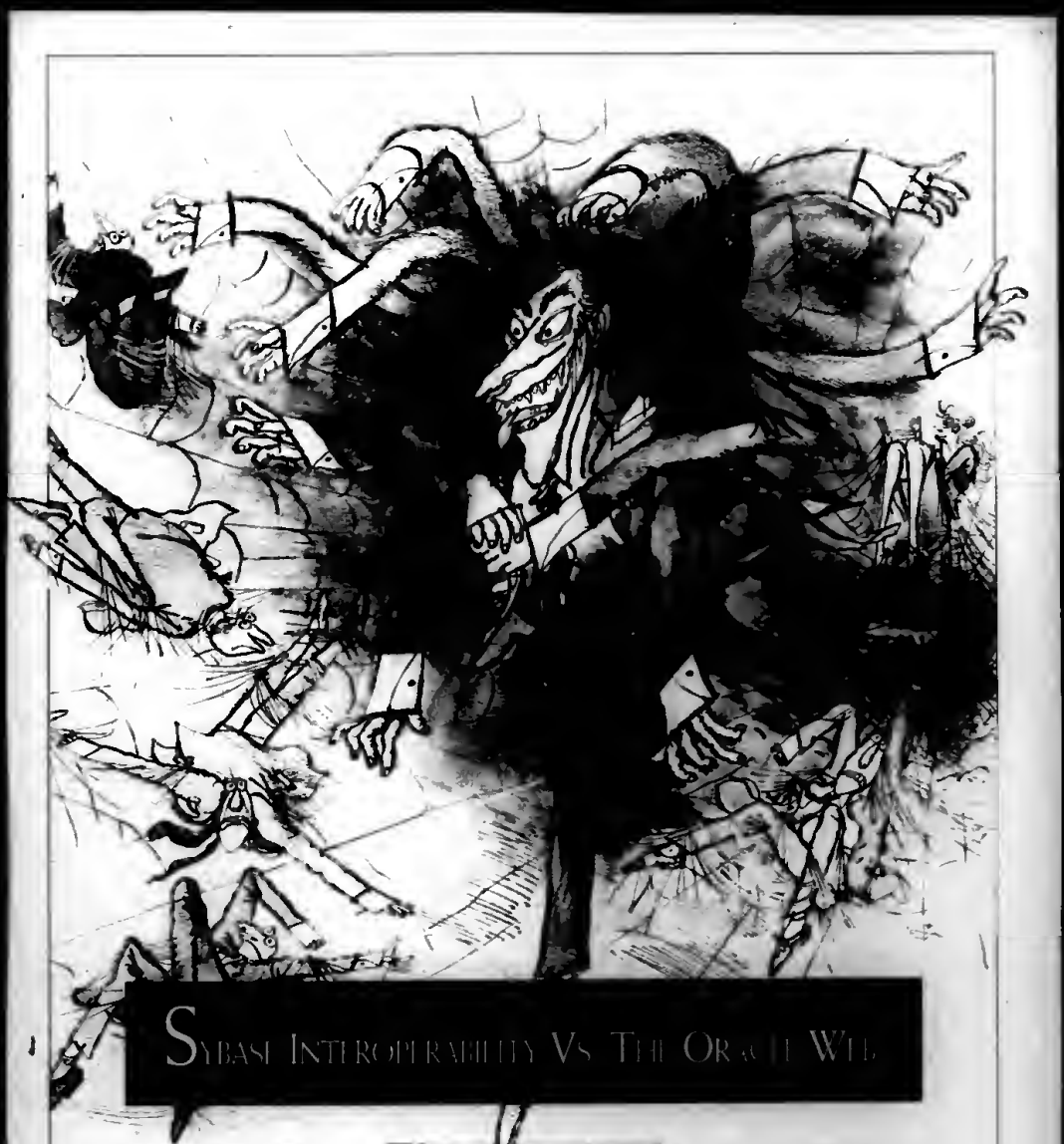
The skill levels of system users also need to be carefully examined. How familiar and comfortable are users with existing applications? What is their attitude about learning to use new applications? What resources are available to help them make the transition?

Choose the Right Partner

Finally, developing a migration strategy that works requires selecting the right partner to provide the right assistance. This can be the most important decision to be made in determining success or failure.

Sun is uniquely positioned to help customers take full advantage of enterprise client/server computing. We have the Unix and open systems networking professionals, leading-edge tools and technologies, best-of-breed third-party solutions, diverse educational resources, and global experience. Our experts know how to make your vision of success work in the real world.

Lawrence Hambly is president, Sun-Service Division, Sun Microsystems, Inc. ◆



Sybase Interoperability Vs The Oracle Web

Interoperability. The ability to access and work with virtually all enterprise data – wherever it may be.

Only Sybase offers it, because only Sybase has the true open client/open server architecture that makes interoperability possible.

Forrester Research, Inc. agrees, "Sybase is a connectivity powerhouse. Oracle falls way behind on the connectivity front."

Four Key Differences	Sybase	Oracle
Open client/server architecture	Yes	No
Read/write access to 20+ databases	Yes	No
Database independence	Yes	No
125+ *certified* tools	Yes	No

Say "yes" to true interoperability. 700 of the Fortune 1,000 have. It's one of the many reasons they've chosen Sybase. client/server for the enterprise. For details, call 1-800-SYBASE-1, extension 6144.

SYBASE®
People Bet Their Business On Us

Outside the U.S. call (510) 774-8944. © 1994 Sybase, Inc. Sybase is a registered trademark of Sybase, Inc. Other company and product names may be trademarks of their respective owners. Forrester Research, Inc. is located in Cambridge, MA.

BY WILLIAM RADUCHEL

EXTENDING *Systems Management to the Enterprise*

Information technology (IT) departments today are asked to strike a difficult balance. Not only must they provide an integrated computing environment with easy access to computing resources, they must give individual departments the freedom to select their own specific hardware, software, and networking resources. What's more, they must cut costs while providing higher levels of service.



WILLIAM RADUCHEL

These corporate requirements, combined with intense external competitive pressures, have been the driving forces behind the move to client/server computing.

Most large organizations today are interested in some or all of the benefits of client/server computing. In fact, in a recent survey of Fortune 500 companies, 97% of respondents indicated that they had plans to implement some form of client/server computing. So it's no longer a question of whether to move to client/server. It's a question of how.

It's no longer a question of whether to move to client/server. It's a question of how.

Client/server merges the best features of previous environments, adds new functionality and increased flexibility, and offers the best potential for maximizing return-on-investment and competitiveness.

However, the benefits of client/server computing come at the expense of increased complexity in systems management practices. Systems in legacy environments were typically distinct, discrete elements. A client/server computing management strategy must mirror the interdependencies and integration strategies of a distributed environment. That means it can't be "bolted on" after the client/server environment is in place; it must be thought through and implemented concurrently with the enterprise architecture.

This article presents a structured framework we've developed for analyzing the many issues that must be addressed. We believe you'll find it to be a useful tool in tackling the challenges of developing, deploying, and managing resources in an enterprise client/server environment. The following framework breaks down enterprise systems management into smaller, more easily digestible pieces.

Building the Foundation

Without a strategic approach to systems management, pitfalls can occur. Companies have suffered higher IT costs, missed business opportunities, revenue loss due to network outages, and inefficiency of both computer users and administrators.

The competitive impact of a flexible, manageable infrastructure can be enormous. The right enterprise systems management strategy allows an organization to:

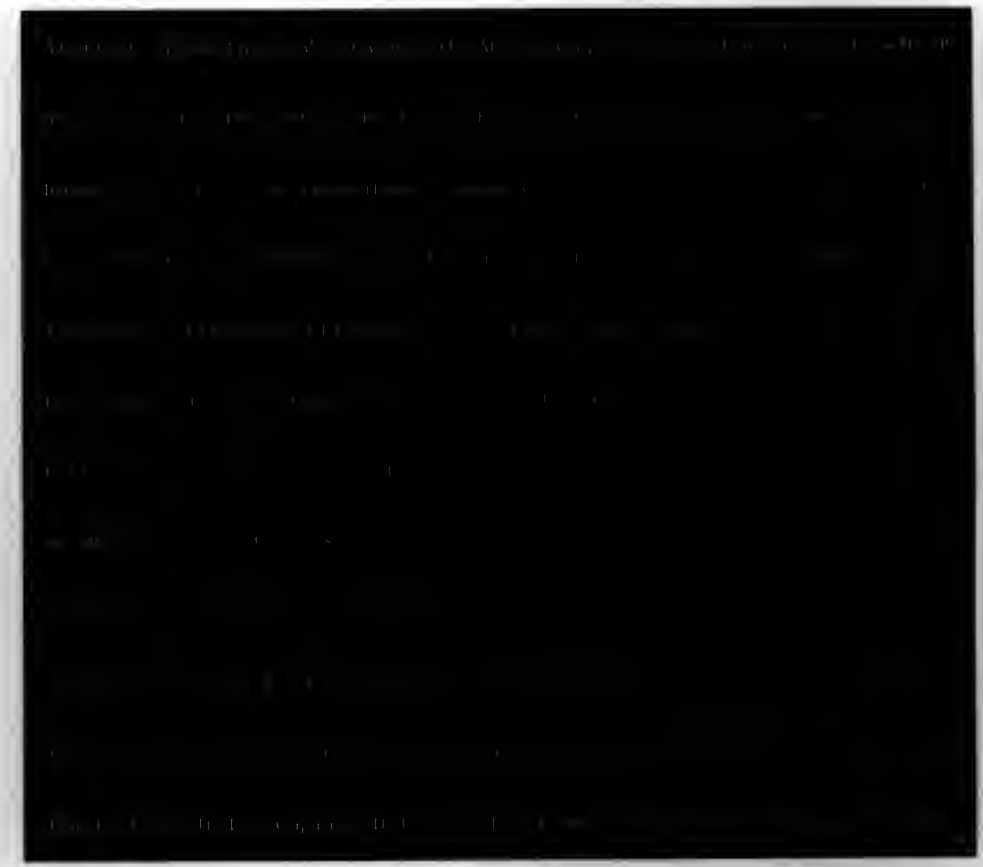
- Maximize overall system performance while minimizing long-term cost of ownership.
- Protect all aspects of the enterprise from unauthorized access, corruption, and disaster.
- Optimize enterprise productivity so the system is a source of continuous competitive advantage.
- Control enterprise computing resources for maximum quality and efficiency.

Sun Microsystems' experience with both the risks and rewards of rebuilding the enterprise systems management infrastructure has led to the creation of a three-tiered approach that takes into account people, process, and technology issues. Understanding these three tiers is the first step toward building the enterprise systems management foundation.

People Issues: Transitioning the IT Organization

An information system is only as

PeopleSoft has a name for these client/server visionaries: *customers.*



These companies, and hundreds more, had the vision to make the move to client/server. And the wisdom to choose the most experienced client/server business software provider in the industry. That's why they are using PeopleSoft Financials and HRMS. Please call us at 800/947-7753 for our white paper: *Client/Server Business Solutions*. And find out how easy it is to become a visionary for your company.

PEOPLESoft

Play by your own rules.™

©1995 PeopleSoft Inc. All other company and product names may be trademarks of their respective owners.

Extending Systems Management ... continued

good as the people who make it work. The corporate culture, skill sets of the IT organization, and organization structure in general should be key considerations in designing a systems management strategy.

A working partnership is needed between centralized IT staff and business units.

Recently, workgroups have tried to gain independence by breaking away from IT monarchies, but they've created a new set of problems: compatibility issues, cost overruns, failure to leverage existing systems, and more.

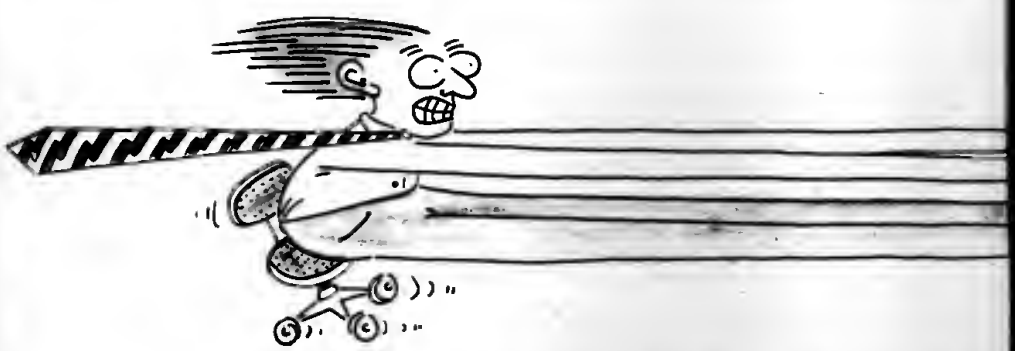
What's needed for effective management of distributed systems is a partnership between centralized IT staff and business units. At Sun, for example, all IT personnel who support the enterprise infrastructure report to a centralized IT organization; IT personnel who support business units become part of those units. This fosters cross-departmental communication, gives IT employees a better appreciation of business issues, broadens the technical training of many employees, and helps everyone learn to find a middle ground between what's right for the corporation and what's right for the business unit.

Process Issues: The Big Rules

Since the whole point of client/server computing is to facilitate change, systems management processes should also work to facilitate change. Specifically, processes should follow Sun's five "big rules" and be:

- small
- simple
- separable
- scalable
- stateless.

For example, by limiting the selection of system and database configurations, enterprises can meet the needs



UNAWARE OF ITS SPEED, FRANK TRIES OUR NEW

Like a lot of other Microsoft® Windows users on TCP/IP networks, Frank used to spend a lot of time waiting for corporate data to trickle down to his PC. But no more. Now Frank has PC-NFS*pro*™ - SunSoft's™ new high performance TCP/IP networking software. So he can fly around his organization or even the Internet, accessing applications, and sharing information, with more speed and functionality than ever. The reason is, PC-NFS*pro* is built on a 32-bit VxD architecture, and optimized for Windows. Giving Frank access to hundreds of Windows applications, plus built in e-mail, and remote services, all operating at peak performance. It installs fast, too. In fact, it automatically connected Frank to his

© 1994 Sun Microsystems, Inc. Sun, Sun Microsystems, SunSoft, NFS, PC-NFS, PC-NFS*pro* and the SunSoft logo are trademarks or registered

of end users without sacrificing interoperability and automation. Standard configurations also ensure that data is stateless; it's not owned by anyone and can be accessed by any authorized user. Other processes that should follow this strategy are system/database configurations, change management, and software distribution.

Technology Issues: Getting Higher Performance at a Lower Cost

In order to increase overall system performance while lowering total ownership costs, client/server technology must meet a number of enterprise-wide criteria. In addition to managing multiple systems, it must provide information at the enterprise level, and that requires the integration of what used to be separate tasks: database, systems, and network administration. Tools that make this possible are widely available; however, that's both a blessing and a curse. The blessing is that the tools deliver tremendous improvements of enterprise performance at dramatic cost reductions; the curse is that there's confusion over standards. The solution is to use an open systems approach; one that can accommodate multiple industry standards today and adapt to new standards tomorrow.

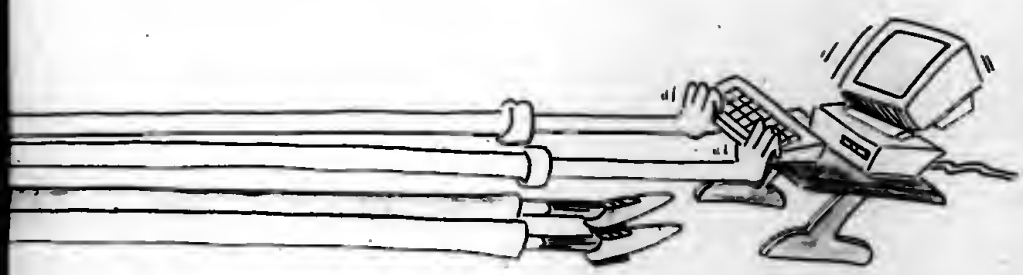
Solving Specific Problems

Let's consider how a business can go about solving specific challenges in data, application, and network management.

The solution is to use an open systems approach.

Data Management: Maximizing Availability and Integrity of Data

Next to people, data is the organization's most valuable asset. But, as the volume and distribution of data grows exponentially, how can organizations prevent data corruption without driving up storage costs?



TCP/IP WINDOWS SOFTWARE FOR THE FIRST TIME.

local network in less than two minutes. PC-NFS*pro* also can connect a few or a few thousand users, in LANs or WANs. And thanks to new Windows tools and advanced network technology—like DHCP, PPP, and NFS—everyone can have easy configuration, remote access, and transparent file sharing. And right now, you can have PC-NFS*pro* at very attractive prices. Like $50 for an evaluation package, and upgrades of anyone else's networking software starting at just $115. Call us at 1-800-SUN-SOFT for more details. But beware. PC-NFS*pro* is a lot faster than what you're used to. Right, Frank?

SunSoft

APRO

Trademarks of Sun Microsystems, Inc. All other products or services mentioned herein are trademarks of their respective owners.

CUSTOMER PROFILE

DUNLOP TIRE

Dunlop Tire Races To An Open Future

Fragmented, outdated information systems were once the bane of Dunlop Tire Corp.'s existence. The company was rapidly losing ground to competitors which could process orders faster and run their operations at lower cost. To respond more quickly and efficiently to the demands of a competitive marketplace, Dunlop developed an ambitious IS plan based on open systems and a clear strategic direction. "Having the right architecture design strategy is essential for us to meet our goals," says Dennis Courtney, Dunlop's Director of Information Systems. In Dunlop's case, that approach features GUIs, Oracle database management, and Sun servers as the primary hardware platform.



DENNIS COURTNEY
DIRECTOR, INFORMATION SYSTEMS

DECOUPLING DATA

Central to Dunlop's strategy is separating data and applications from each other. "That's key to our goal of getting information to whomever needs it," says Courtney. The strategy calls for each of Dunlop's three main locations to have two Sun SPARCserver 1000s — one for running their Oracle database, the other for running core business applications. Not only is data access improved, system performance is maximized.

Other applications are run on the dozen or so SPARCserver 10s and 20s that Courtney reserves for that purpose. "A modular approach to CPU deployment is more flexible and easier to manage," says Courtney. "And the Sun servers have yet to go down."

BUYING, NOT BUILDING

Dunlop has made a strategic decision to wherever possible become a package-oriented shop, buying applications from outside vendors that conform to open standards and fit into Dunlop's strategic framework. "Instead of coders and legacy systems specialists, we're becoming process analysts and integrators," says Courtney.

This decision has a two-fold benefit. First, it allows Dunlop to satisfy application requirements without the burdensome expense of developing them from the ground up. Second, it allows the IS staff to get closer to their customers on the business side, instead of burying themselves in extended programming projects.

Thus, IS staffers build strategic core competencies, rather than focusing on commodity skills easily purchased elsewhere. This strategy makes vendor selection critical. Dunlop has chosen Oracle Corp. which not only provides its own financial, manufacturing, and analytical applications, but also has strong third-party vendor support. "With Oracle, we can add best-of-breed products from other vendors and integrate them with what we already have in place," says Courtney. Sun Microsystems is also a key partner in Dunlop's new approach. "Sun not only makes great hardware, they are an invaluable source of expertise for infrastructure planning and design," says Courtney.

ACROSS BOUNDARIES

With a centralized database architecture and a distributed network infrastructure, Dunlop is well-positioned to support the type of cross-functional operations that makes for a responsive, fast-moving business. At the same time, Dunlop has had to change its IS subculture. Courtney has built cross-functional teams responsible for project design, rollout, and maintenance. "We put Unix people, network people, and support people together," says Courtney. "They're in self-directed teams that take full responsibility for results — no finger-pointing allowed."

The approach extends beyond the IS department to include Dunlop's strategic suppliers. "We have the Sun and Oracle people sit down with our own staff so we can work together on current and long-range issues," says Courtney. "As partners, we share expertise and make strategic architectural decisions together."

Dun & Bradstreet Software

and

Sun Microsystems

are

open for business.



Dun & Bradstreet Software's open SmartStream® client/server software now runs on UNIX computing systems from Sun, and the result is a whole world of choices for how you manage information. Using the two together will help you streamline the business process within your organization. We're not just talking blue sky, and we are ready to prove it. Call us at 1-800-290-7374, ext. 745 and let us really open your eyes.

Dun & Bradstreet Software

Sun

Sun Microsystems Computer Company
A Sun Microsystems, Inc. Business

© 1995 Dun & Bradstreet Software Services, Inc. SmartStream is a registered trademark of Dun & Bradstreet Software Services, Inc. UNIX is a registered trademark licensed exclusively through X/Open Company, Limited

CUSTOMER PROFILE

HOLIDAY INN

Holiday Inn and IT Double Up For Profits

Holiday Inn, the world's largest hotel chain, utilizes a worldwide real-time information system to provide customer service and drive revenues

"We're constantly monitoring demand for rooms in real time," says Don Lynch, Holiday Inn's Director for Worldwide Hotel Systems Development. Based on that demand, discount programs can be used as required to maximize occupancy, so no room ever has to be sold for less than its real market value.



DON LYNCH
DIRECTOR FOR WORLDWIDE HOTEL SYSTEMS DEVELOPMENT

BUILDING A RESPONSIVE ARCHITECTURE

Holiday Inn Worldwide (HIW) achieves this continually tuned balance through a carefully crafted IS architecture. The applications architecture forms a triangle connecting three points: the PC-based front desk application running at each site, the mainframe IBM Transaction Processing Facility running in Atlanta headquarters, and the Informix-based HIRO (Holiday Inn Reservations Optimizer) system that runs on a Sun SPARCcenter 2000, also located in Atlanta.

Reservations taken at the front desk are constantly monitored. Holiday Inn's system can quickly respond to changing conditions regardless of the pace of reservation traffic.



ROBUSTNESS, RELIABILITY, SCALABILITY

A sophisticated satellite-based network provides instantaneous data communications between the hundreds of hotels dispersed across the globe and Holiday Inn's headquarters. The combination of TCP/IP as the network protocol and "cookie-cutter" Unix configurations in each hotel provide a high level of manageability as well.

Essential to the successful rollout of the HIRO system was Holiday Inn's Sun hardware platform. "We needed the scalability of a symmetrical multi-processing architecture," says Lynch. "For price and performance, we couldn't beat Sun." With constant responsiveness to changing conditions, the uninterrupted system availability is essential as well.

The rollout schedule required gradual implementation of HIRO at a growing number of sites over time. "We bought the SPARCcenter 2000 with eight processors, knowing we could go up to twenty," says Lynch. In fact, Lynch's staff has found the server's modular design makes it simple to modify their servers themselves.

MORE INFORMATION, MORE PROFITS

HIW is now implementing a data warehouse approach that will allow Holiday Inn to flexibly use all the information resource it develops through its hotel operations as a powerful competitive weapon. "Within 72 hours of each day's closing, we have all the information on all our customers 'scrubbed' and in place," says Lynch. This information is essential for Holiday Inn to achieve strategic goals and execute critical operations.

The long-term goal is to move to a true three-tiered architecture, whereby front-line hotel operations will be fully decoupled from back-end resources, with the intervening middleware layer enabling Holiday Inn to flexibly design information processes according to their critical business needs. "This is a very exciting time to be in IS," says Lynch. "Our ability to contribute to competitiveness and profitability has never been greater."



EXPERIENCE
IS THE FOUNDATION OF GROWTH.

We have more UNIX® experience than anyone in the industry—experience that can help your business flourish. Our team of experts supports 500,000 systems in 125 countries. But that's just the beginning. As the only major company totally focused on open, client-server solutions, we have the expertise to bring you comprehensive IT consulting, integration, system support, IT operations, and education services. In fact, we're helping companies all around the world make the most of their information systems. We think we can do a lot for your business, too. ◆ For more information, on how to make your business grow, call 800 821-4643 or your local SunService representative.

SunService

Your Enterprise Service Partner

© 1995 Sun Microsystems, Inc. SunService and the SunService logo are service marks of Sun Microsystems, Inc. All other product or service names mentioned herein are trademarks of their respective owners.

THE PROMISE OF WINDOWS NT HAS FINALLY BEEN DELIVERED.

IT JUST COMES IN A SLIGHTLY DIFFERENT PACKAGE.



We'd like to tell you about a 32-bit software environment that delivers performance, not promises. It's called Solaris.™ With over 1.8 million users, Solaris is the number one software environment for global enterprise networks.† It's also the highest volume database engine running Oracle, Sybase and Informix, the most widely used multi-processing software environment and even the dominant gateway for the information superhighway. Solaris runs over 9300 32-bit solutions,‡ as well as Macintosh, DOS and Windows applications like Microsoft Office and Lotus SmartSuite. It's not picky when it comes to hardware, either. It's the only 32-bit software environment that runs on x86 PCs, SPARC™ systems, and soon, even Power PC. And it's scalable from 486 laptops to Cray superservers. Solaris is enterprise ready, too. Unlike PC desktop based environments, it offers the most popular system and network management tools in the industry, so you can finally get your enterprise under control. From PCs to mainframes, nothing moves, monitors and manages information better. All of this capability means that with Solaris, you don't have to compromise your existing hardware and software investments. And Solaris is, of course, backed by the most experienced client/server support organization in the world. Now, you're probably wondering why you should wait for the promise of NT when you can call 1-800-SUN-SOFT and get Solaris now. Exactly.



SunSoft

Use Mosaic to reach us on the Internet at http://www.sun.com/. †SPARC applications. ‡Among UNIX operating environments. ©1995 Sun Microsystems, Inc. Sun, Sun Microsystems, SunSoft, the SunSoft logo and Solaris are trademarks or registered trademarks of Sun Microsystems, Inc. SPARC is a registered trademark of SPARC International, Inc. All other products or services mentioned herein are trademarks of their respective owners.

Dell delivers package for high-end servers

By Jaikumar Vijayan

• Dell Computer Corp. is adding more muscle to its server lines. The company recently announced availability of its Server Management package for users of its PowerEdge multiprocessor servers running Novell, Inc.'s NetWare.

The management package, which sells for $499, integrates Dell's Safesite server management software with Intel Corp.'s recently announced LANdesk Management Suite 2.0.

The package includes the following features:

- A drive array performance monitor that gives the status and performance of the SCSI array subsystem.
- Performance and traffic monitors for customized monitoring and analysis of performance and traffic across the entire network or individual servers.
- An alert management system that allows definable alert conditions and can alert by fax, page or on-screen if certain conditions are triggered.
- A mobile network administration feature that allows remote log-ins and diagnostics.

For users, the increased availability of server management software such as Dell's highlights a growing vendor emphasis on bringing manageability and dependability to the server arena, analysts said.

For instance, last week Compaq Computer Corp. announced it will introduce its Insight Manager server management software and other features such as error checking and correcting memory, drive array management and disaster recovery services to its mainstream server lines. Other companies, such as IBM for instance, have made server management tools the linchpins of their PC server strategies.

Snap to it

At the same time though, Dell has taken a different approach to server management by snapping together its management software with Intel's LANdesk open server tool set, which works with a variety of Intel hardware, said John Dunkle, president of WorkGroup Technologies; Inc. in Hampton, N.H.

"By snapping Dell systems architecture into Intel's open tool suite, they are offering their customers an expansion in server and network management capabilities" that is very different from what other vendors offer, Dunkle said.

The package allows not just the management of the server, but all the local network assets using a single suite of management tools, Dunkle said.

The new software is available now.

Briefs

Compaq, Inventec team up

Compaq Computer Corp. said it had established a manufacturing and design relationship with Inventec Group, a Taiwanese manufacturer [CW, Jan. 23]. Inventec will build a high-end, multimedia notebook, due out by midyear, said Hugh Barnes, Compaq's senior vice president of the portables division. Barnes said Compaq began looking for a partner in the middle of 1994 because it saw its position in the market lagging. Barnes said Inventec's experience in building not only notebooks, but also personal digital assistants and calculators, would be helpful to Compaq.

IBM outlet gets heavy traffic

IBM's PC factory outlet store to Morrisville, N.C., has been a smashing hit, according to the company. Open just one year, the store, which mainly sells overstocked, refurbished and withdrawn products at sharply discounted prices, has been drawing an average of 400 clients a day — far more than IBM had anticipated.

CyberSource adds Mac titles

Internet software shop **CyberSource Corp.** in Menlo Park, Calif., said last week it will now carry Macintosh titles on its Internet site, software.net. Some 2,100 Macintosh titles will be available for on-line distribution, said CyberSource, which now claims a total of 7,800 titles at its site. Separately, the privately held firm announced the appointment of James Hogan, former head of worldwide development and marketing of information technology services at CompuServe, Inc., as its vice president of marketing.

Intrafed joins with Paperclip

Intrafed, Inc. in Bethesda, Md., will integrate its Powerscan front-end document input and processing software with Hackensack, N.J.-based **Paperclip Imaging Software, Inc.'s** Paperclip retrieval software. After scanning documents with Powerscan, users can manage documents regardless of origin.

Fax at last

Users may finally be able to link their fax machines and PCs by this summer when Japanese vendors **NEC Corp.** and **Ricoh Co.** market their Microsoft Corp. At Work-based fax machines, the companies disclosed last week. Initially, NEC will market its machine in Japan but is considering overseas sales, a spokeswoman said. Ricoh will sell its machine in the U.S. first.

Apple swings into graphics, multimedia

By Mark Halper

Apple Computer, Inc. has unveiled a bevy of graphics and multimedia products in hopes of reinforcing its leadership in those areas. Users, while impressed, were lukewarm about their implementation plans, especially because some of the products are not yet available.

Apple's product barrage, launched at the Demo '95 conference in Palm Springs, Calif., two weeks ago, included a three-dimensional version of the company's QuickDraw graphics program, called QuickDraw 3D. It also included what Apple called a desktop virtual reality system, or QuickTime VR, and a videoconferencing system called QuickTime Conferencing.



Apple's QuickDraw 3D *allows developers to build three-dimensional performance into graphics programs*

Quick on the draw

QuickDraw 3D is intended to allow developers to build 3-D performance into graphics programs. Apple is positioning QuickDraw 3D as a product that brings workstation-quality graphics to the desktop with Apple's signature ease of use. About 20 third-party software houses have pledged support for the program, Apple said.

Quick costs

Apple said pricing of various QuickTime Conferencing kits will range widely — from $200 to $6,000.

While some users viewed the program as suitable for technical purposes, others saw potential for everyday use.

"It opens up a lot of opportunities for presentations," said Bruce Gordon, project director at Walt Disney Imagineering in Glendale, Calif., and a Power Macintosh user. "Everybody has gotten so slick with desktops and video presentations that they all look the same now. So the ability to rotate objects will help distinguish a presentation."

But QuickDraw 3D may not be widely available any time soon. The company plans to ship developer's kits this summer and include the software as an operating system extension in future Power Macintoshes that use the Peripheral Component Interconnect (PCI) bus. The PCI boxes are also due this summer.

Dave Nagel, senior vice president of Apple's AppleSoft division, said the company plans to build the feature into its operating system in mid-1996, when Apple's next-generation operating system, Copland, is due. Users will also pay an overhead price because QuickDraw 3D will require 16M bytes of memory, Apple said. The company has not set pricing.

Meanwhile, Apple's QuickTime VR will require even heftier memory: Apple recommends no less than 40M bytes of RAM. The company plans to make QuickTime available to developers next month and provide a Mac OS and Windows version.

Programs written to QuickTime VR will allow users to walk through and around 360 degrees of a site that has been photographed and stored to a disk. QuickTime VR also permits users to zoom in on a scene and pick up objects. Most QuickTime VR programs will be CD-ROM-based, an Apple spokeswoman said.

Apple charges a $2,000-per-seat licensing fee for the product, plus a royalty fee that ranges from 40 cents to 80 cents per unit for commercial applications that use QuickTime VR.

John Grabrick, senior systems engineer at 3M Co., a large Macintosh shop in Minneapolis, said he envisions plenty of practical uses for the technology.

"It would be good for taking a look at a machine line or a plant," he said. "You take a few photographs and come back and take a walk through to see what kind of modifications you need."

Eytan Bernet, director of software engineering at educational software vendor Tom Snyder Productions in Watertown, Mass., was also enthusiastic about the concept but said that his own trial runs have proved QuickTime VR is not yet ready for prime time. "QuickTime VR is very impressive, but there [are] a lot of problems to terms of bugginess," he said.

Several users contacted agreed that Apple's new videoconferencing program is also not ready for business deployment. At Demo '95, QuickTime Conferencing delivered jerky, small-frame video of a remote conference caller.

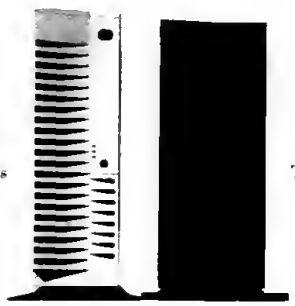
Apple has yet to set availability, but a spokeswoman said the company is working with "a wide range of companies, including [telephone companies], network, software and hardware providers and developers to provide a range of solutions." Those solutions should be available in the second half of this year, according to Apple.

Some users said they do not see the need for videoconferencing.

"The 'warm fuzzy' of having someone 'present' from a foreign site would be nice but not necessary," said Frank Calabrese, manager for personal computing at Bose Corp. in Framingham, Mass.

Five reasons why IBM PC Servers actually live up to the name server.

The IBM PC Server 300 for Small LANs



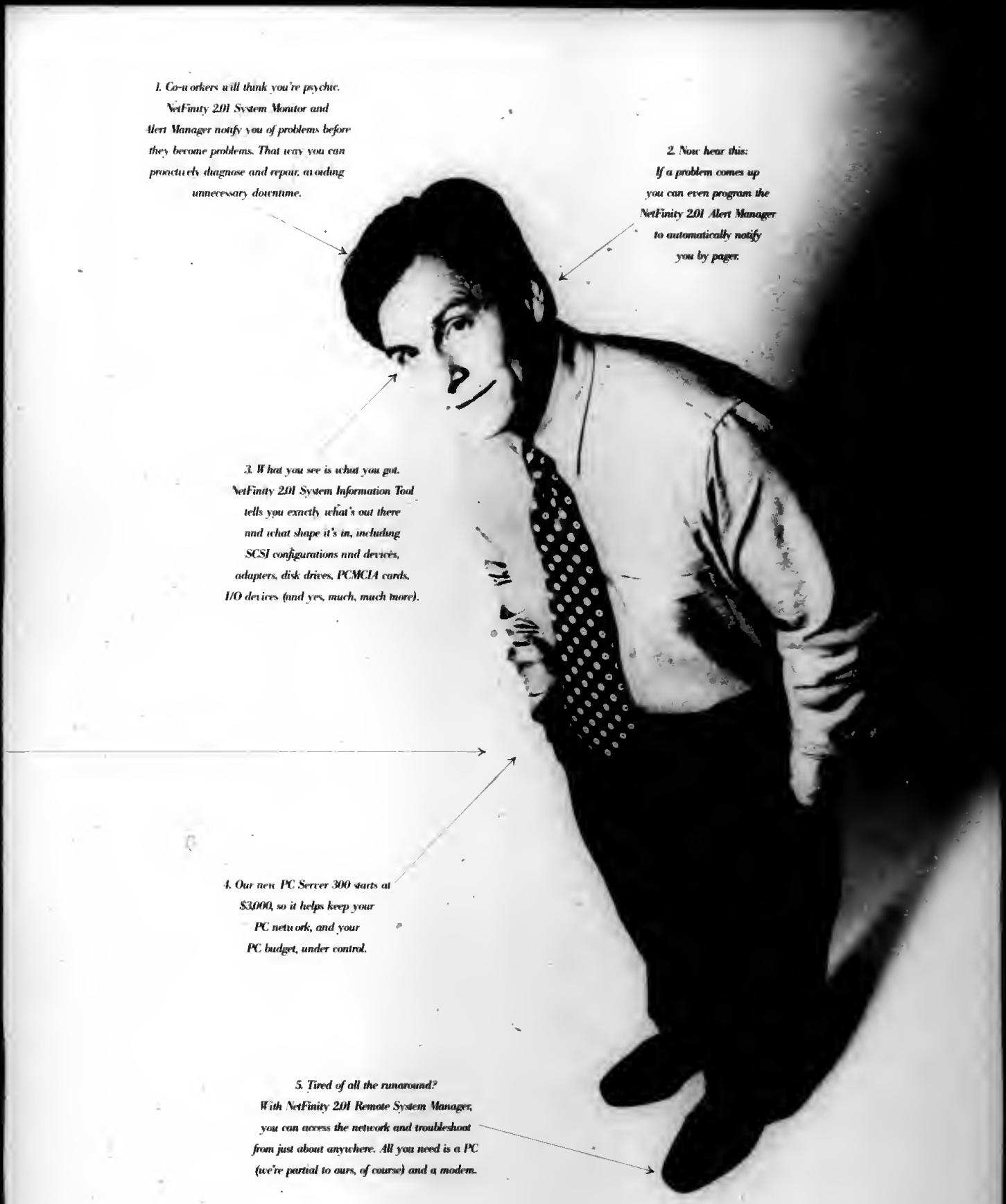
The IBM PC Server 500 for Enterprise Networks

If it ever feels like the network you run is running you, you'll be happy to hear about the IBM PC Server 300 and the new PC Server 500. Because we've engineered these servers to make managing your network a lot easier.

Along with legendary IBM reliability and extraordinarily comprehensive service and support, we offer NetFinity™ 2.01 Software. Available as an option on the PC 300 and standard on the PC 500, NetFinity is a feature-rich systems management tool that, unlike other software, monitors not only your server but all of your PCs as well. And for those of you running OS/2® or AIX® with NetView® LAN Management, NetFinity 2.01 will even send you SNMP alerts.

For complete details on the new IBM PC Servers with NetFinity 2.01, contact your IBM Authorized Business Partner. Or call 1 800 IBM-4FAX and we'll fax information directly to you. (Key in ID# 3079 for the PC 300, 1624 for the PC 500, or 2509 for NetFinity.)

There is a difference™ IBM.



1. Co-workers will think you're psychic. NetFinity 2.01 System Monitor and Alert Manager notify you of problems before they become problems. That way you can proactively diagnose and repair, avoiding unnecessary downtime.

2. Now hear this: If a problem comes up you can even program the NetFinity 2.01 Alert Manager to automatically notify you by pager.

3. What you see is what you get. NetFinity 2.01 System Information Tool tells you exactly what's out there and what shape it's in, including SCSI configurations and devices, adapters, disk drives, PCMCIA cards, I/O devices (and yes, much, much more).

4. Our new PC Server 300 starts at $3,000, so it helps keep your PC network, and your PC budget, under control.

5. Tired of all the runaround? With NetFinity 2.01 Remote System Manager, you can access the network and troubleshoot from just about anywhere. All you need is a PC (we're partial to ours, of course) and a modem.

PC Direct prices and offerings subject to change or withdrawal. Dealer prices may vary. IBM, AIX, NetView and OS/2 are registered trademarks and NetFinity and There is a difference are trademarks of International Business Machines Corporation. ©1995 IBM Corp.

[redacted]

MapLinx Corp. has announced MapLinx for Windows 3.0, data mapping software.

According to the Plano, Texas, firm, MapLinx for Windows 3.0 lets users view data geographically on a U.S. map. It works with leading Windows databases, contact managers and spreadsheets.

Features include enhanced thematic shading, automatic range calculations, querying by distance to locate points within a defined range and display of up to 64 different symbols. The product is network-ready and can label all major state and interstate highways.

MapLinx for Windows 3.0 costs $149.

▶ *MapLinx*
(214) 231-1400

Innovative Solutions & Technologies has announced OpenExchange Pro 1.5 for Windows, software that provides data import and export capabilities to database applications.

According to the Joplin, Mo., company, OpenExchange Pro 1.5 for Windows lets users link fields between differing file structures while selecting data formatting functions from a field properties screen.

The product can query and reformat data without programming, merge mailing lists into a single list, parse names and addresses into separate fields and transfer data to a laptop.

OpenExchange Pro 1.5 for Windows costs $189.

▶ *Innovative Solutions & Technologies*
(417) 781-3282

Hewlett-Packard Co. has announced the HP E3491A Pentium processor probe, a run-control functionality probe that works with HP's logic analysis and prototype analyzer systems.

According to the Palo Alto, Calif., firm, the probe attaches to the system being tested and provides access to the processor's registers so it can be debugged.

The product also lets the screen of the prototype analyzer display the complete state of the Pentium system.

The HP E3491A costs $7,500.

▶ *Hewlett-Packard*
(415) 857-1501

Antec, Inc. has announced Descartes, a PCMCIA card reader/writer internal drive for PCs.

According to the Fremont, Calif., firm, Descartes fits into a 3½- or 5¼-in. floppy drive bay and lets users use any PCMCIA memory card, hard drive, LAN, modem or peripheral device on the desktop.

The product lets two cards work simultaneously and comes with a card-ejection mechanism. It costs $149.

▶ *Antec*
(510) 770-1200

Motorola, Inc.'s Transmission Products Division has announced the Lifestyle and Power series desktop 28.8K bit/sec. data/fax modems.

According to the Huntsville, Ala., firm, the modems support Caller ID, provide enhanced security, connect with all lower-speed modems and include a ClearFax feature that eliminates fuzzy faxes.

The Lifestyle series is targeted at home and first-time PC users for information retrieval from on-line services, interactive gaming and electronic shopping and banking.

The Power series is targeted at business users and includes a distinctive ring feature that simplifies the sharing of a single phone line by a fax machine, answering machine or telephone.

Lifestyle modems cost $325 for PCs and $345 for Macintoshes. Power modems cost $375 for PCs and $395 for Macintoshes.

▶ *Motorola*
(205) 430-8000

Product short

MicroTouch Systems, Inc. has introduced the Mac n' Touch AV-14, a touch monitor for Macintoshes. The product combines MicroTouch's touch technology and Apple Desktop Bus controller with Apple Computer, Inc.'s AudioVision monitor. Cost: $1,610. MicroTouch Systems, Methuen, Mass. (508) 659-9100.

OmniBook

CONTINUED FROM PAGE 39

appeared to perform about the same as the 66-MHz 486 chips on desktop machines — fast enough for most rational notebook applications. The audio is comparable to that of other notebooks, which means you may need to hook up external speakers to the system's audio out port if you want to impress listeners.



HP's OmniBook 4000 *offers an exceptional screen and warranty at a low price*

The battery lasted a little more than two hours when the machine was used for sporadic tasks and a little less than two hours when playing multimedia titles. HP offers a utility that estimates the remaining time on the battery.

The unit comes with Microsoft Corp.'s MS-DOS 6.20, Windows for Workgroups 3.11 and preinstalled utilities. Utilities include one for mouse cursor and tracking control, system configuration and Traveling Software Corp.'s LapLink remote access software.

The package works through OmniBook's modem, the infrared port or a cabled network. The unit comes ready-to-run, with no assembly or preparation involved.

Not perfect

The documentation is not up to HP's usual high standards, but any user with computer experience can set up the OmniBook and add peripherals. The biggest shortcoming in the Quick Start manual is the description of external ports and an ambiguous description of how to replace a battery.

The machine does not open any new technological territory, but the screen and warranty are exceptional.

If you are looking for a high-end notebook and price is an object — and especially if you can take advantage of the infrared port to make a network connection — the OmniBook 4000 is a strong contender.

Angus is project director at The Data Works Limited in Seattle.

Lotus

CONTINUED FROM PAGE 39

This means organizations can now build training clips or short marketing pieces and release them throughout the workplace or to customers whether they are multimedia-equipped or not.

Show, not tell

However, the product's real advantage is in showing end users how to do things that normally have to be explained in person. For example, Kemper Securities, Inc. in Chicago spends much time and energy training new brokers and assistants on computer systems and procedures, said Joel Tepp, vice president of investments at Kemper.

"I am strongly recommending to Kemper that we put together a training library for using our in-house system," Tepp said. He said 90% of the calls from end users to Kemper's help desk concern only 10% of the features in their word processors and spreadsheets.

Tepp said the ScreenCam training clip would cost him about three hours to develop and could be distributed to Kemper's 160 servers over a weekend.

"This would compare to spending thousands of dollars per branch for third-party training," he said.

Users noted one shortcoming in the program: The movie clips still cannot be edited on a frame-by-frame basis. To make changes, the editor must replay the entire clip to redo any audio sequence. However, most of those interviewed said that because they are producing only 10- to 15-minute video clips, this shortcoming is not that big an obstacle for them.

"It should be used for getting a quick and dirty simulation on the screen," Yockelson said. "It's aimed at reducing the shadow [information technology] calls, not as a full-motion video replacement."

Yockelson said ScreenCam has appeal for companies that want to demonstrate to prospective clients how their products work or that want to conduct mass mailings. The demonstrations could be performed by simply running the ScreenCam movie stored on a diskette.

Easier with screen clips

The Federal Document Clearing House in Boston uses the product to demonstrate how to gain access to its content — congressional documents and testimony — via on-line services, said Jim Ellis, a managing director at the firm. Ellis said the clearinghouse found it much easier to build a screen clip to demonstrate how to access the content than to try to explain it verbally.

"How do you explain to someone how to navigate through something like the Internet to find these documents? It's a lot easier to just show them," he said.

ScreenCam Release 2.0 will be available before the end of the first quarter. The product requires an Intel Corp. 80386 or higher running Windows 3.1 and DOS 3.3 or higher, and a VGA 16-color graphics adapter and monitor. Pricing is not yet available.

LUCE Press Clippings is No.1 in Computer and Hi-Tech

- Luce has more hi-tech clients.
- Luce reads more computer and related media than any other clipping service.

In comparison tests with other clipping services, Luce is No.1 with:

Most Clippings
Most Accurate
Fastest Delivery
Most Useful Clipping Analysis

LUCE PRESS CLIPPINGS 1-800-628-0376

where you are





Access the Globe.

Simply put AT&T Paradyne is about one thing and one thing only Giving you access to the network The public network the private network, any network From the network of the future From where you are right now Take our modems We have a range that can put you in touch with the rest of the world And each one is rigorously tested Proven reliable Supported by AT&T And competitively priced No one but AT&T Paradyne gives you more ways or more cost-efficient ways to access the globe

COMSPHERE 3800/3800Plus Modems - *V.32bis 14.4 Kbps and V.34 33.6 Kbps from $6500*

COMSPHERE 3900 Modems - *For leased line applications V.32bis 14.4 Kbps and 19.2 Kbps from $1995.00*

DataPort /DataPort Express Modems - *Data fax 14.4 or 28.8 Kbps from $1200*

KeepInTouch Cellular Modem - *PCMCIA data fax 14.4 or 28.8 Kbps Direct connect cable and ITC from $349.00*

KeepInTouch Express Modem - *PCMCIA data fax 14.4 or 28.8 Kbps from $239.00*

ext 744 today Get your 1995 AT&T Paradyne Interactive Product Catalog play the exciting game Access the Globe and find out if you're in on

AT&T Paradyne

BUY A 486 NOW.
IT'S DESTINED TO BECOME A CLASSIC.





intel inside
pentium

If you encounter a compatibility problem within three years after the original purchase we guarantee that Dell's engineers and technicians will work with you to identify the cause and recommend a solution. For a complete copy of our limited compatibility guarantee, contact Dell at *intended to run on comparable ISA or EISA systems of the same vintage. †For a copy of our 3 Year Limited Warranty please write to Dell Computer Corporation 2214 W. Braker Lane Bldg. 3 Austin, TX 78758. ‡Prices valid in the U.S. only. Some products and promotions.*
Inside and Pentium Processor logos and Pentium are trademarks of Intel Corporation. Windows is a registered trademark of Microsoft Corporation. Dell disclaims proprietary interest in the marks and names of others. ©1995 Dell Computer Corporation. All rights reserved.





In their day, the abacus, the adding machine, and the 486 were state-of-the-art computing.

Now, on the eve of the introduction of Windows® 95, you have a decision to make: when to begin standardizing on Pentium™ processor-based systems.

If you're already committed to upgrading to Windows 95 when it hits the shelf, you need the Pentium processor to deliver the performance that your users will demand. Windows 95 will run on a 486 – but it'll probably run about as well as Windows 3.0 did on the 386. And who's got time for that?

But even if Windows 95 isn't an immediate priority, the decision is the same. Buying Dell® Pentium processor-based systems now is a smart investment in your company's computing infrastructure. Because the Dell OptiPlex™ gives you a Pentium processor-based system for about the price of a 66MHz 486-based system. And it equips you with features like Plug-n-Play and PCI – new standards that will improve ease-of-use and support increasingly demanding applications.

And now every Dell Pentium processor-based system you buy will have the updated Pentium processor.

So call us. We'd hate to see you get stuck with a museum piece.

OPTIPLEX™

COMPUTERS OPTIMIZED FOR COMPLEX NETWORKED ENVIRONMENTS:

UPDATED PENTIUM™ PROCESSORS

- 3 Year Warranty*
- Guaranteed Compatibility*
- Custom Configuration
- Guaranteed Technical Support

DELL OPTIPLEX 560/L
60MHz PENTIUM PROCESSOR

- 8MB RAM/270MB Hard Drive
- VS14 Monitor (14" CRT, .28mm)
- Low-profile Chassis

$1699
Product Code #300247

DELL OPTIPLEX XL 575
75MHz PENTIUM PROCESSOR

- 8MB RAM/540MB Hard Drive
- VS14 Monitor (14" CRT, .28mm)
- Low-profile Chassis

$2129
Product Code #300275

DELL OPTIPLEX XL 590
90MHz PENTIUM PROCESSOR

- 16MB RAM/540MB Hard Drive
- VS14 Monitor (14" CRT, .28mm)
- Low-profile Chassis

$2745
Product Code #300293

DELL OPTIPLEX XMT 590
90MHz PENTIUM PROCESSOR

- 16MB RAM/1GB Hard Drive
- VS15 Monitor (15" CRT, .28mm)
- Mini Tower Chassis

$3185
Product Code #300295

DELL

(800) 433-7857

MONDAY-FRIDAY 7AM-9PM CT • SAT 10AM-6PM CT
SUNDAY 12PM-5PM CT • CANADA• CALL 800-387-5755
KEYCODE #12024 • MEXICO CITY• CALL 800-228-7811

800-933-4177 Guarantee applies to PC hardware only and does not extend to software or devices not may not be available outside the U.S. Prices and specifications subject to change without notice. The Intel

AST

INTRODUCING MANHATTAN. THE BIGGEST THING SINCE MANHATTAN.



If Manhattan is one of the world's leading business centers, then our new line of servers is aptly named.

Because there isn't a company around that wouldn't benefit from having an AST Manhattan™ server at its center.

Manhattan servers are quite simply the most advanced you can buy. Recently voted "Best of Show" by LAN Times/ Data Communications at Networld+Interop, they include almost every feature found on competitive servers, and then some.

Essential technologies like disk array's, fault tolerance, network management tools, ECC memory, Pentium™ processors, PCI local bus and environmental monitoring are only the start. For once, "state-of-the-art" is no idle cliché.

In addition, Manhattan servers are totally compatible with your network.

To make sure of it, AST has formed strategic alliances with companies like Microsoft, Intel, IBM and Novell. The fact is, our Manhattan servers were used as a development platform for Windows NT,™ OS/2™ and Netware.™

Now, if you've ever had any concerns about server reliability, let us set your mind at ease. *PC World*™ rated AST among the top manufacturers for reliability and service. We offer AST customers around-the-clock phone support, a 3-year on-site warranty** and a selection of extremely responsive service programs.

You can call us at 800-876-4AST for more information. Better yet, we'll give you the name of the reseller near you who's ready and waiting to put together your ultimate server solution.

Because, from now on, there will only be two kinds of servers. AST Manhattan servers. And second best.

Manhattan P Series
The pinnacle of LAN power Intel 90MHz or 100MHz Pentium processors, dual processor capable, PCI/EISA bus, hot-swappable disks and ECC memory

Manhattan V Series
THe affordable high-performance LAN server. Intel 90MHz Pentium processor, dual processor capable, PCI/EISA bus, environmental monitoring and server management tools.

Manhattan G Series
The power-driven workgroup server Intel 60MHz Pentium processors, PCI bus and server management tools

Manhattan SMP
The ultimate enterprise server. Up to 5 Intel Pentium processors, extensive fault-tolerant features, EISA bus, disk array standard, 16 hot-swap drive bays and ECC memory

Manhattan HighRise
The scalable solution for managing your resources. Rack-mount up to 4 P or V series servers for the ultimate in convenience and ease-of-use

AST COMPUTER

YOU'LL LIKE THE WAY WE WORK™

Intel and Intel Inside are registered trademarks of Intel Corporation. All other brand and product names are trademarks or registered trademarks of their respective companies. **Warranty varies outside the U.S.

Videoconferencing slowly goes desktop

Benefits abound but cost, coverage and need eludes many customers

By Mary Brandel



Andrew Drummond did not let cynicism get in his way of installing desktop videoconferencing at Johnson Controls, Inc. in Plymouth, Mich. At least not for very long.

"If you'd asked me [about desktop videoconferencing] six months ago, I would have said it wouldn't be ready for another year or two," said Drummond, a LAN manager at the automotive seat manufacturer.

That was then. Today, 15 Johnson sites participate in international training, technical support and even software distribution via Intel Corp.'s ProShare desktop videoconferencing system.

Johnson Controls is one of a small and slowly growing number of true believers. For those companies, desktop videoconferencing applications are spreading like wildfire (see story below).

But while many companies are dabbling in the technology with two- to three-system pilots, widespread deployment is still two to three years away.

On one hand, software and equipment prices are plummeting 30% per year, said Will Strauss, an analyst at Forward Concepts, a research firm in Tempe, Ariz. And while users grumble about high transmission costs and spotty coverage, many are successfully using ISDN to conference within their own enterprises. Some users are employing plain old phone lines.

However, quality is still not up to full-motion-video standards, and while interoperability is improving, the confusing standards wars and complexity of setup are enough to discourage the hardiest of users (see story at right).

Moreover, "people don't necessarily need video," said an analyst in California. "They have to find a damn good reason to do it."

Indeed, at this point desktop videoconferencing is most popular among companies with a high need for collaboration, such as design and engineering firms. Many are either adding video to data collaboration applications (where users talk and share data but do not use video) or have already been using room-based systems. If you've already justified upward of $50,000 for a group conferencing system, desktop videoconferencing is easy, users said.

"This stuff pays back in a matter of months," said Ken Pawlak, marketing communications manager at Carrier Corp., a subsidiary of United Technologies Corp. in East Hartford, Conn.

A key to cost-justification is that "you can milk this to do anything you want," Pawlak said.

A picture is worth...

The following are average costs of an ISDN-based desktop videoconferencing system for 10 users

Software (Cost per seat: $1,000-$2,500)	$10,000-$25,000
Hardware*	$1,600-$2,000
ISDN installation	$3,000
Annual ISDN usage charge**	$3,600-$12,000
Total first-year cost	$18,200-$42,000

*Average price for a 66-MHz, 486-based PC

**Does not include long-distance charges, which are generally twice as much as telephone long-distance charges.

Source: Multimedia PC Systems, Richardson, Texas

A piece of the action

Carrier originally thought desktop videoconferencing would help it with training and remote technical support. But product designers soon wanted a piece of the action, and managers realized it would help them better conduct financial reviews. That is how an eight-system pilot in August turned into a 60-system rollout earlier this month, with AT&T and its Vistium videoconferencing system the vendor and system of choice.

Bottom-line benefits, Pawlak said, include cost and time savings as well as increased productivity and efficiency.

But hospitals, universities, small businesses and even corporations are also using videoconferencing to fill in personnel and expertise gaps, said Stephen Shao, director of the office of applied research at Tennessee State University, which uses PictureTel Corp.'s PCS 100 system.

And soft benefits figure in strongly as well. "It gives a personal touch to the business," Drummond said.

For instance, why do United Technologies managers need to see one another during financial reviews? Why not just use data collaboration to share spreadsheets?

"It's human nature," Pawlak said. "You've got to look someone in the eye if you're cutting their budget by 50% or asking them what happened with a particular customer."

But the turning point for widespread desktop videoconferencing deployment, analysts said, hinges on further price drops.

A little while ago, people were willing to pay $295 for a word processor. Now it

Videoconference, *page 85*

Creative sparks fly

If you want to light users' imaginations on fire, give them desktop videoconferencing.

"So many different needs have grown out of [our original system] that everybody has designed a use for it," said Andrew Drummond, a LAN manager at Johnson Controls.

"Once the whole organization is connected, the justification becomes relatively simple. You need ubiquity before it can work," said David Mack, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H.

At Johnson Controls, training and technical support were the originally slated applications. Now the company also uses Intel's ProShare for software distribution. "While we're talking, we can show [users] how to run [the application] and transfer it at the same time," Drummond said.

Next, Drummond said, the legal department wants videoconferencing for depositions and meetings.

Of course, high use leads to bandwidth problems for LAN-based systems. That is why LAN-based systems are at a very experimental stage for most companies.

At Johnson, Drummond uses Intel's LANDesk to monitor use. "Once I hit 10% of available bandwidth, I don't allow any more calls over the network. I put them over ISDN instead," he said.

That was not an option for The Chase Manhattan Bank NA in New York. Earlier this month, the bank rolled out a system from Unidata, Inc. in Flushing, N.J.

Bandwidth was so precious that "we took [videoconferencing] out of band" and went to the phone lines, said Mark Baranovic, vice president of the trading technology services group at Chase.

"If something as silly as a shortage of bandwidth created a financial loss, that would be intolerable," he said.

—Mary Brandel

Many obstacles to overcome

Last year saw much progress, but many hurdles remain before videoconferencing will become widespread. These include the following:

Poor interoperability
Standards groups are working on it, but you currently cannot videoconference between two different vendors' systems on the LAN.

Out on the wide-area network, long-distance carriers do not interoperate. Bridges are available but expensive. Local carriers provide a way around the problem.

Current LAN systems cannot dial out to WAN systems. PictureTel is working on a transcoder, which is slated for late 1995 availability at $1,500 to $2,000 per port. Intel is also beta-testing a new version of ProShare that would allow an H.320 upgrade and thus a gateway to the WAN.

So-so quality
Despite improvements, today's systems are not like TV. Desktop systems tend to operate at 15 frames/sec. vs. the 30 frames/sec. of room-based systems. This creates a jumpy, jerky image. You can control this somewhat with a good compression algorithm. And many desktop systems are designed simply to show a single person in a small window of the screen. So if you want to see a group or a full-screen image, you will have to go to a full-CIF (rather than quarter-CIF) format.

ISDN coverage and cost
Users cited coverage improvements for ISDN. "It's projected to [cover] 85% [of the U.S.] by year's end," said Andrew Drummond, a LAN manager at Johnson Controls. But because of today's gaps, "desktop videoconferencing is pretty much limited to operating within an enterprise," said Alfred Ricossa, founder of MultiMedia PC Systems.

Most users plan to use ISDN or switched-56. However, many said they believe that ATM or even plain old phone lines are the next frontier.

—Mary Brandel



*In Canada call **1-800-GO-LOTUS** © 1995 Lotus Development Corporation, 55 Cambridge Parkway, Cambridge, MA 02142. All rights reserved. Lotus. Working Together.



All the info-hype about what's coming down the pike in a year or two is kind of curious when you realize that there are these incredibly powerful tools working for business right now

Like Lotus® Freelance Graphics.® Freelance is powerful because its so easy to use In fact, you can put together presentations on the fly – for one-on-one meetings, conferences with your peers, sales calls. Basically, any time you have ideas to share with someone else, you can do so more effectively with Freelance Graphics.

Lotus NotesReady

Freelance Graphics is part of Lotus SmartSuite® the complete desktop solution for just $299 Call **1-800-TRADE-UP, ext. A623*** for the free Lotus Product Gallery CD including complete trial versions and information on all Lotus products

Freelance Graphics, SmartSuite and Lotus Notes are registered trademarks and NotesReady is a trademark of Lotus Development Corporation. Where do you want to go today? is a trademark of Microsoft Corporation.

Lotus
Working Together



One thing is certain in this constantly changing, dynamic world of information technology. You'd better be well informed if you expect to remain competitive.

It's impertative that you devise a strategic business plan based on the most reliable, insightful, and conclusive market data available today.

For 30 years, the leading executives in the information technology industry have built on their success by attending IDC's Computer Industry Briefing Session. Spend just one day with top analysts from International Data Corporation and gain unique insight into the future of IT. Obtain an objective viewpoint of the industry today and what's ahead for tomorrow as we probe the issues and trends impacting emerging technologies.

To register and for more information, call:

1-800-343-4952

Tuesday, March 7, 1995
Boston, MA
Hynes Convention Center

Tuesday, March 28, 1995
Santa Clara, CA
Santa Clara Convention Center

Sponsored by:

INFOWORLD

!INFOTAINMENT WORLD

IDC

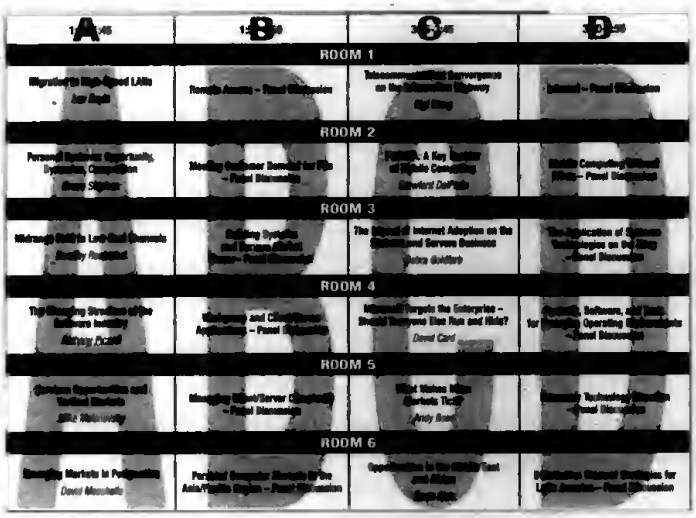
NETWORK WORLD

COMPUTERWORLD
The Newspaper of IS

AGENDA

9:00-11:50 MORNING SESSIONS

- **Introduction**
  Kirk Campbell, President & CEO
- **Transition to the Mass Market Era**
  David C. Moschella, Senior V.P., Worldwide Research
- **User Information Technology: Results of IDC's Annual Global IT Survey**
  David Vellante, Senior V.P., Systems, Storage & Software Research
- **Technology for the Next Wave**
  John Gantz, Senior V.P., Desktop Research



Special Guest Moderators

Bob Metcalf, Vice President of Technology, International Data Group
Pat Ferrell, President, Infotainment World
John F. Rousseau, Executive Vice President, Infotainment World
Paul Gillin, Editor, Computerworld
Michael Fitzgerald, Senior Editor, Mobile Computing, Computerworld

IDC

International Data Corporation
5 Speen Street, Framingham, MA 01701
(508) 872-8200 Fax (508) 935-4789

HP reverts to engineering roots

By Jean S. Bozman
PALO ALTO, CALIF.

After spending most of 1994 trying to sell the concept of Unix workstations as desktop machines that serve enterprise applications, Hewlett-Packard Co. has decided to leave most of those desktops to Windows. Instead, HP will resume its traditional stance as a provider of workstations to engineers in large companies.

HP is launching an Empowered Engineering marketing program, which it quietly piloted with some of its largest customers several months ago. The program ensures that HP's workstations have software compatibility with Sun Microsystems, Inc. networks; new financing packages to induce more sales and trade-ups; and packaged software and consulting services that complement hardware sales.

In January 1994, HP had positioned its Model 712 workstation as an ideal universal desktop that could access enterprise applications running on Unix servers. That strategy worked, but mostly for customer service applications that tapped multiple databases with low-end workstations, said Bernard Guidon, general manager of HP's Workstation Systems Division. The gain amounted to just a small slice of all workstation sales, he said.

Keeping watch

HP is looking for new users, particularly in large Sun sites, with its Empowered Engineering strategy. HP had 22.6% of the Unix workstation market for the year ended September 1994, compared with Sun's 27.7% share, according to Dataquest, Inc. in San Jose, Calif.

HP's renewed engineering focus is a counterattack to the move by Sun — HP's workstation rival — to emphasize the commercial market, users and analysts said.

"They're getting back to their roots," said Doug Eltoft, president of the interWorks, Inc. HP workstation user group and network operations director at the University of Iowa's engineering college in Iowa City. "They did an analysis of what was going on, and their commercial foray with workstations wasn't as successful as they had planned, so they are putting renewed emphasis on their historical base in the technical workstation market."

HP is trying to lure more engineering managers at large companies away from Sun toward HP for computer-aided design and software development.

Guidon said last month that the Empowered Engineering program is aligned around several large software categories, including mechanical computer-aided design, electrical computer-aided design and software development. HP is also targeting a variety of industry-specific market segments, including the oil industry, architectural engineering and medical visualization, Guidon said.

Other aspects of the company's plan include HP workstation support for Sun's networking software, collaborative software to allow engineers to design in teams and new finance arrangements that encourage technical trade-ups.

"We have been putting quite a lot of investment into making the workstation product line able to interoperate with a Sun environment," Guidon said. That includes support for Sun's GNC+/NIS networking software and support for industry standard Distributed Computing Environment (DCE) software, which can link Sun and HP units into a single, unified network.

HP may be trying to repeat its success selling Unix servers through its 3-year-old mainframe-alternative program. With Sun rather than IBM being the rival to the workstation space, HP hopes to capitalize on another vendor's installed-base migration.

"What HP is doing is a take-off on their mainframe-alternative program but aimed at the engineering space," said Nina Lytton, president of Open Systems Advisors, Inc. in Boston. "They're targeting what they think is a forgotten level of corporate management — engineering managers." She said Guidon is an architect of HP's mainframe-alternative strategy.

No effect expected

HP users who know of the plan said it may not change their buying patterns right away. Most said they buy when they run out of capacity or when the depreciation of their installed workstations has run its course. But they are just as likely to buy a Sun or Silicon Graphics, Inc. Unix workstation, provided it meets their project's technical requirements.

User needs, rather than workstation specs, determined the type of equipment Northrop Grumman Corp. purchased for a recent re-engineering project, said Joe Dugan, an independent consultant who helped Northrop Grumman install eight HP Unix servers and 220 workstations. "Those workstations were bought for a particular [business] focus, and we really defined the requirements," he said. Yet a large aerospace firm is the type of account HP counts on for volume sales of workstations in its bid to surpass Sun as the top worldwide workstation supplier, HP said [CW, Jan. 23].

But some users said HP's emphasis on providing an end-to-end solution was a factor that made HP hardware more attractive. At Black Clawson Co.'s Shartle Division in Middletown, Ohio, HP installed an open systems, high-speed 100M bit/sec. network — complete with routers — and supplied 30 HP Unix workstations and two Unix servers.

Videoconferencing

CONTINUED FROM PAGE 81

comes bundled with the computer. That will happen with teleconferencing, according to some analysts.

Either as an application or as part of the operating system, "video will become an integral part of PCs," said Alfred Ricconi, founder of Multimedia PC Systems, a Richardson, Texas, consultancy.

Of course, many users will substitute this basic functionality with higher quality packages. How much would they be willing to pay? Three hundred to $500 is what most analysts say.

The current per-seat price is $2,500, but the $1,000 barrier will be broken before the end of the year, Ricconi said. Future prices of $300 to $500 are indeed possible with advances such as Vivo Corp.'s software-based compressor/decompressors.

Of course, you need a 486-based or, some say, a Pentium-based PC to run that kind of software. Vendors claim the software can run in a 386-based PC, but "if you don't have a 486 PC with 66 MHz, it doesn't run as smoothly," Drummond said.

Despite all the perceived benefits, even true believers understand that desktop videoconferencing remains difficult to justify.

"People don't understand video . . . and what the visual image can do for you," Pawlak said.

At the same time, "five years from now, people will be working in ways they never dreamed of," predicted Joseph Caspar, principal scientist at United Technologies' Research Center. "And teleconferencing will be a part of it."

[redacted]

Stan Schatt

Network managers live chaotic lives



Remember the good old days, the days of Ozzie and Harriet? The well-ordered and harmonious family life of the Nelson family was reflected in the IS workplace. The glass house of the data center had a place for everything and everything was, naturally, in its place.

Contrast that with today's network environment. The Nelson household has given way to the chaotic world of the Simpsons. Contrast the glass house manager of the early 1960s with the LAN manager of the 1990s.

George (it was always a man) was immaculate with his starched white shirt, narrow tie and short haircut. Dressed in a white lab coat, George was a scientist whose field was so esoteric that few could interpret the technical terms he sprinkled into his conversations with noncomputer employees.

Keeping up with product knowledge was relatively simple for George. He read one industry publication and depended on regular visits from his IBM account executive. If the system had any problems, help was as simple as one phone call away. George didn't have to worry about the future. There was bound to be a new mainframe down the road if his company continued to grow.

Fast-forward now to the '90s. LAN manager Lynn dresses casually because the job now requires hands-on tinkering, including a willingness to take apart a file server when necessary. Management no longer asks politely whether or not information is available. Instead, they demand a report and specify that it must be delivered within a couple of hours. The typical network manager's area is filled with spare network cards, assorted product literature and various printer and network operating system manuals, as well as assorted software that really needs to be tested and then installed.

Problem after problem

A network console program is probably running and is tracking local and remote connections. Someone in Boston keeps trying unsuccessfully to log on while a local intelligent hub is reporting a bad Ethernet card. There are so many voice messages saved that the blinking light on the phone is solid red. The network manager's chair contains several handwritten notes as well as something unknown in the 1960s — yellow Post-it notes that are plastered all over the area, including on the monitor.

A one-vendor solution today is just a dream. The network manager is not sure who will take responsibility of interoperability problems that develop on a network that contains a Cisco router, a Bay Networks hub, Microsoft Word and Novell's NetWare network operating system.

Instead of having the telephone guy call the Bell company if a phone line is needed, the network manager must talk to a half-dozen vendors to narrow down the remote access options. Would fractional T1 be better than frame-relay service? Would a software router do the job at the branch office, or is a hardware solution preferable? Should ISDN be part of the solution?

Perhaps one thing hasn't changed. Remember how the glass house operated 24 hours a day, 365 days a year? Today's LAN manager seems to be working the same schedule. There is one key difference, however. It's just one long shift instead of three. Makes you feel kind of nostalgic, doesn't it?

Schatt is a LAN service director at Computer Intelligence InfoCorp in La Jolla, Calif.

When We Say Server



s, We Mean Business.

Taking care of business. It's what you need in a server. And it's why your business should call ours.

For 10 years we've been packing power into some of the world's best portable PCs. Now we're doing the same for larger computers. Like the ones that run your workgroup, or even your whole company.

Fact is, we've made it our business to be one of the most connected computer companies in the world, and that's why we can offer a full range of reliable, fault-resistant servers.



INTRODUCING THE HIGH-PERFORMANCE Z-SERVER GT:

Up to four Pentium 90MHz CPUs

Upgradable to P6

Intel Multi Processor Specification 1.1-compliant

BALANCED I/O DESIGN

PCI and EISA bus slots

Dual Wide & Fast SCSI-2 disk controllers standard

Up to 1 GB ECC memory

RELIABLE

Hot removable hard disk drives

PCI RAID controller

Server management features

3-Yr limited warranty

3-Yr on-site service

Z-SERVERS are easy to install, maintain and upgrade. Plus, they're designed to work with everything in your environment, from computers to operating systems to applications.

But we don't stop there. We also deliver the dependable service and support you need. What's more, our remote management tools give you the power to monitor hardware, diagnose problems, set alarms and perform preventative maintenance from any PC on the network. You'll find we work well with budgets, too, which means you get all the performance users are asking for, at the price your accounting department demands.

intel inside
pentium PROCESSOR

For more information and all the specs, give us a call today. Because once you put the power of Z-SERVERS at your side, hey, you're in business.

1-800-289-1320, Ext. 5145

ZENITH DATA SYSTEMS

Make The Connection

Copyright © 1994, Zenith Data Systems Corporation. "Make The Connection" is a trademark of Zenith Data Systems Corporation. Contact Zenith Data Systems for status on certification and copies of certification reports. Intel Inside is a registered trademark and Pentium Processor is a trademark of Intel Corporation. All other trademarks are property of their respective holders.



For 1200 dpi printing, there's really only one choice. There are, however, several options.

The new Optra family from Lexmark.

At Lexmark, we don't limit top-of-the-line features to our top-of-the-line printers.

The new Optra™ family is the first full line of network-ready, desktop laser printers capable of true 1200 x 1200 dpi* printing. Each Optra laser printer, from the extremely affordable 12 ppm Optra R to the extremely powerful 16 ppm Optra Lxi, delivers four times the sharpness of ordinary 600 dpi printers.

yes It runs with NetWare®

No matter which option you choose, our breakthrough MarkVision™ printer utility is standard. Users and LAN managers can control and configure every Optra on the network, and monitor job statistics, right from Windows™ or Macintosh workstations.

PostScript™ Level 2 and enhanced PCL® 5 emulations are also standard. Which means that every Optra prints incredibly sharp graphics and beautiful, crisp text from virtually any of your applications.

All this value and innovation from Lexmark, a former division of IBM. For more information, call us at **1 800 891-0399, ext. 105.**

Thanks to the new Optra family, you can choose the best printer, rather than the best compromise.

LEXMARK™

ADVANCING THE ART OF PRINTING

*1200 dpi requires additional memory for complex files. Lexmark products are manufactured under the ISO 9002 approved quality process. The Energy Star emblem does not represent EPA endorsement of any product or service. Lexmark, Optra and MarkVision are trademarks of Lexmark International, Inc. NetWare is a registered trademark of Novell, Inc. Windows is a trademark of Microsoft Corporation. Macintosh is a registered trademark of Apple Computer, Inc. PostScript is a trademark of Adobe Systems Incorporated, which may be registered in certain jurisdictions. PCL is a registered trademark of Hewlett-Packard Company. © 1995 Lexmark International, Inc.



This is What Your Monthly Savings With Marathon™ Could Look like.

One of our Marathon customers saves the equivalent of a '59 Corvette every month. That translates to roughly $20,000.

And while your business may have little use for vintage automobiles, it serves to illustrate a point: you can save serious money with Marathon. Even if you're a small business.

Here's how. If you have several remote locations (two to 250), you can link them with simultaneous voice, fax and data communications over a single phone line. Up to eight channels at once. Typically, you'll save enough to pay for the Marathon system in under a year. And you'll pocket the savings thereafter.

Whether you have two or 250 locations, Marathon delivers all communications on one line. Return this card or call for your free brochure today. Find the certified Marathon Distributor in your area by calling (800) MICOM AD (642-6623) or (805) 583-8600. 24-hour fax (805) 583-1997.

And start planning what you'll do with the savings.

1034

MICOM

Products That Pay for Themselves™

Name _____

Company _____

Address _____

_____

Phone _____

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 906 SIMI VALLEY, CA

POSTAGE WILL BE PAID BY ADDRESSEE

MICOM Communications Corp.
4100 Los Angeles Avenue
Simi Valley, CA 93063-9949

[redacted]

NEC Technologies, Inc. has announced the RISCserver 2200, a dual-processor workgroup server for Microsoft Corp.'s Windows NT.

According to the Boxboro, Mass., company, the RISCserver 2200 is aimed at the database transaction processing market and is based on two 200-MHz VR 4400 processors from Mips Technologies, Inc.

The system features a 32-bit Extended Industry Standard Architecture RAID controller with up to 64M bytes of cache, three SCSI-2 channels, 2G- and 4G-byte drives and up to eight hot-swappable drive bays.

Prices range from $11,400 to $25,000.

▶ *NEC Technologies*
(508) 264-8000

SunSoft, Inc. has announced Novell, Inc. IPX/SPX protocol stacks as optional modules for its SolarNet software.

According to the Mountain View, Calif., company, the optional modules integrate with SunSoft's Solaris 2.4 Unix operating system.

The product lets PCs on Novell NetWare LANs access Unix applications running on Solaris Unix servers.

The optional module costs $395.

▶ *SunSoft*
(415) 960-3200

TechSmith Corp. has announced Enterprise Wide 2.5, client/server remote access software.

According to the East Lansing, Mich., company, Enterprise Wide 2.5 provides remote log-in and log-out in a single Windows session, faster file transfer speed and support for multiple concurrent network protocols.

The product provides users with access to Notes servers and optimizes the transport process between remote workstations and the LAN gateway to improve application responsiveness.

The software is based on Novell, Inc.'s Multiple Link Interface Driver architecture and supports Novell's IPX burst mode.

Prices start at $2,495.

▶ *TechSmith*
(517) 333-2100

Software Partners, Inc. has announced Re:mark, a software add-on to Adobe Systems, Inc.'s Acrobat 2.0.

According to the Mountain View, Calif., company, Re:mark lets users mark up and review documents in a workgroup setting. Users can distribute electronic documents in Adobe's Portable Document Format (PDF), edit on draft PDF files and return the copy to the originator.

Features include free-form ink drawing, highlighting, strikeout, underlining and pop-up comments. Pictures, bit maps, sound files, movies, spreadsheets or text files can be attached to the document, according to the company.

Re:mark costs $129.

▶ *Software Partners*
(415) 428-0160

Applied Systems Engineering, Inc. has announced Robofax Pro Lite, on-demand fax software.

According to the Sunnyvale, Calif., company, Robofax Pro Lite provides single-line fax-on-demand services. Users can scan in documents, fax directly to Robofax or convert Windows documents with Delrina Corp.'s WinFax Pro.

Features include password protection of documents and a smart dialing feature that automatically adjusts for the new North American Numbering Plan method of dialing numbers.

Robofax Pro Lite costs $795 for software, voice/fax board, microphone and speaker.

▶ *Applied Systems Engineering*
(408) 736-1485



"Marathon buys one of these every month"

"We were skeptical about the savings. Even after we saw a live demonstration, we didn't think Marathon could save our classic Corvette dealership all that much money. But we figured we'd save at least enough to pay for the equipment and then keep some savings each month. So we installed a MICOM Marathon Data/ Voice Network Server in our Saugus Massachusetts showroom and another in our new Pompano Beach, Florida facility.

Marathon let us route incoming calls between our locations for free.

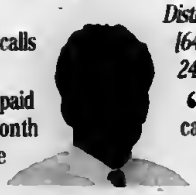
In just the first month, the savings paid for both Marathons. And every month since, Marathon has saved us the equivalent of a '58 Vette.

I'm Tony Visone of Visone Motors. I sell investments you can use and enjoy. And while a Marathon can't give you the same thrill as a vintage Corvette in your garage, it's an investment that can bring a smile to your face every month."



Whether you have two or 250 locations, Marathon delivers all communications on one line. Ask for a free brochure today.

Call toll-free for the certified Marathon Distributor in your area (800) MICOM AD [642-6623] ext. 1034 or (805) 583-8600. 24-hour fax (805) 583-1997.



"The sooner you call, the sooner you can start investing in something you really want, instead of phone company toll charges."

MICOM®
Products that pay for themselves.™
Trademarks are property of their respective owners.

TELL COMPUTERWORLD'S READERS
you're hiring
in Computerworld's
1995 BEST PLACES TO WORK Magazine.
Deadline: May 3
1-800-343-6474 x201

HAVING THE EQUIPMENT IS ONE THING.



KNOWING HOW TO USE IT IS ANOTHER.

Anixter. We do more than networking. We do it by working with the leading manufacturers to design a network perfectly tailored for you. Making sure it stays that way. And supporting it with technical expertise from people who really understand your network. For cabling systems, networking products and the know-how to get you exactly what you need, exactly when you need it. There's only one place to set your sights.

1-800-ANIXTER

ANIXTER

Electronic commerce

EDI's move to prime time stalled by cost perception

By Suruchi Mohan

The reliance of large companies on electronic data interchange (EDI) for about a decade makes it appear that the technology is deeply entrenched. But in reality, many users are still debating whether to take the giant leap from conventional business practices to EDI.

This was the refrain heard at the Financial EDI conference held recently in San Jose, Calif.

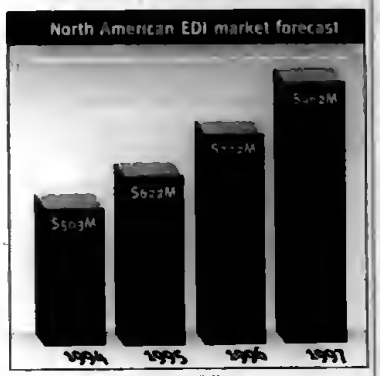
Of the 5 million to 6 million companies in the U.S. with revenue of more than $1 million, only about 80,000 — or less than 1% — use EDI, said Torrey Byles, director of EDI at BIS Strategic Decisions in Santa Clara, Calif.

Factors holding back the proliferation of this technology include the following:

- Perceived high cost of implementation, with no immediate quantifiable return on investment.
- End users' and customers' continued reliance on paper-based methods.
- Lack of smooth integration with legacy systems.
- Alternatives to EDI offered by electronic commerce.

Although the cost of setting up a PC-based EDI system is only around $5,000, "in some cases there is little compelling evidence of a return on investment," Byles said. At the start of an EDI project, a company will spend rather than save money, he said.

"Is EDI the best way for us to do business?" asked Mary Healy, senior treasury analyst at Brinker International, a restaurant chain based in Dallas. She said she attended the conference to see what resources her company would need to implement EDI. Although it might be easy to justify the cost eventually, the initial setup cost would factor into the company's decision, she added.



Source: BIS Strategic Decisions, Norwell, Mass.

Growth spurt

The EDI-related PC market will grow during the next five years, according to Torrey Byles, author of a July 1993 study. He said PC products will increase from representing 44% of total EDI revenue to more than 60%.

Paper appeal

Mind-set is another factor inhibiting the growth of the EDI market. "Small customers still want to write checks," said John Connell, vice president at The First National Bank of Chicago.

The bank has created a system whereby customers can call in using a Touch-Tone phone or a PC to enter business information on the bank's computer. The clients, therefore, do not have to implement EDI in their organizations, and the bank does not have to deal with paper.

Further, implementing EDI in an organization requires re-engineering the business processes, which is always painful, Byles said. Also, "EDI spans many departments, [which] leads to turf wars," he said.

Some of the traditional problems with EDI still remain. It is hard to use EDI with some legacy systems, according to Jim O'Malley, financial EDI manager at Motorola, Inc. in Wood Dale, Ill. "There are too many legacy systems that don't support EDI," he said. That is one of the reasons the technology has limited penetration, O'Malley said.

Although it can be argued that an EDI-enabled PC attached to a mainframe is an inexpensive solution, that is not the only issue with this approach. Legacy systems do not allow cross-referencing, O'Malley said, which is very important in EDI. Nor does EDI lend itself well to integration with different applications.

Interaction is tricky

Also, as much as EDI is a standard, there is a lot of variety in the implementation, which makes interaction harder, O'Malley said. "It is harder to set people up," he said.

This is true not only because of the standards issue but also because of the new possibilities of doing EDI, Byles said. For example, some companies want to experiment with the Internet home pages before they implement traditional EDI. Or they want to try new software that substitutes for EDI.

EDI could certainly use a little more business traffic. Health care would be a prime area, said Donald Schnoor, a product manager at Boatmen's First National Bank in Oklahoma City. But here, too, there is little penetration.

According to a study published by BIS Strategic Decisions in 1993, the health care industry purchased $28 million of gear to develop EDI in-house. But in the same year, health care concerns outsourced $300 million of EDI services.

Microsoft girds for server launch

SMS 1.1 will be integrated with Windows 95

By Laura DiDio
BEDMOND, WASH.

Microsoft Corp. is putting the finishing touches on enhancements to its Systems Management Server (SMS) that, among other things, will make it fully interoperable with Windows 95. The server will also feature setup query scripts to aid businesses in migrating to the new operating system.

These features are due out in SMS Version 1.1, which Microsoft executives said will be delivered in the third quarter.

SMS 1.0, codenamed Hermes, was introduced last November to help users more effectively manage their desktop hardware and software. By automating tasks such as inventory and software distribution, SMS reduces time and labor, according to Phil Holden, SMS program manager at Microsoft's Business Systems Division.



Strong suit

Since it began shipping last November, Microsoft's SMS has garnered an installed base of more than 500 businesses. It is especially strong among banking and telecommunications concerns.

What it will offer

The new features and enhancements will include the following:

- Support for IBM's OS/2 Warp and LAN Server 4.0.
- Remote control and software distribution to branch offices.
- Enhanced query scripts that will offer businesses smooth migration to Windows 95.

The current version of SMS — 1.0 — supports the major LAN network operating system environments, including Microsoft's Windows NT Server 3.5 and LAN Manager, Novell, Inc.'s NetWare 3.x and 4.x, IBM's LAN Server and Digital Equipment Corp.'s Pathworks. BMS also works with the major desktop operating systems, including MS-DOS, Windows 3.1, Windows for Workgroups, Macintosh and OS/2.

"We're currently targeting a third-quarter ship date for SMS 1.1, and we may tie the release to [the debut of] Windows 95 or the Exchange Server," Holden said.

The availability of enhanced query scripts will be of particular help to network administrators in their upgrade to Windows 95. The scripts will show them which desktop PCs can be automatically upgraded to the new operating system based on existing memory and disk space and which PCs may need to be upgraded, Holden said.

This means network administrators "won't waste a lot of time with unsuccessful installation attempts" or spend "countless hours" determining the problems, Holden said.

Users and analysts agreed.

Bob Bowman, chief information officer at Deaconess Health System in St. Louis, has a staff of about 50 who support more than 1,000 users on 20 servers. Deaconess recently installed NT Server 3.5. Bowman said SMS was instrumental in a smooth installation and cost savings.

"NT Server makes my life much, much easier, and SMS makes management much easier. With SMS 1.1, I'll be able to upgrade desktop applications remotely. That means I don't have to add extra staff. It can save us about 30% in staff costs and manpower hours and makes Deaconess operationally more efficient," Bowman said.

Rich Edwards, an analyst at Robertson, Stephens & Co. in San Francisco, said in a recent report that add-on management packages such as SMS, SQL Server and SNA Server are fueling the strong momentum for products in Microsoft's Business Systems Division.

"The strong momentum of Windows NT Server is a given for 1995. Windows NT Server sales have exploded since the release of 3.5 last fall, along with the initial components of the BackOffice suite like SMS, SQL Server and SNA Server. These are must-have items for businesses," Edwards said.

NetWare LANs get link to the Internet

By Ellis Booker

Like fish at the point where the sea meets the river, users of Novell, Inc.'s NetWare have been barred from easily crossing from their LANs to the Internet.

The barrier reef has been incompatible protocols: NetWare's native IPX vs. the Internet's TCP/IP.

LAN administrators with no Unix systems in their shops have had just two choices: Install a dedicated Unix server or equip every PC with its own TCP/IP software, high-speed modem and Serial Line Internet Protocol dial-up connection to the Internet.

But this second approach is a stopgap at best and could be an administrative nightmare, said Cheryl Currid, president of Currid & Co., a technology advisory and analysis firm in Houston. Centralized, supported systems for providing Internet access to LAN users are badly needed, she added.

"LAN administrators face the prospect of having 28K bit/sec. modems on every desk ... because users want to get out," she said. "It'll be the same crisis we had with individual fax machines."

Novell is reportedly at work on a server-based solution for TCP/IP access, but details have yet to be released by the Provo, Utah, company.

Command performance

Meanwhile, third-party vendors are filling the gap.

Earlier this month, Performance Technology in San Antonio announced a LAN-to-Internet connectivity product. This is among the first of what analysts say will be a rolling market for such solutions.

Performance's Instant Internet is a LAN client that attaches to the Internet on one side and a Novell LAN or Performance PowerLAN on the other. The system supports modem connections up to 28.8K bit/sec. or router connections up to T1 speeds. Instant Internet works on Ethernet, Arcnet or Token Ring LANs and supports as many as 50 concurrent users.

"The beauty is you don't have to add a TCP/IP stack to the clients on the LAN or worry about IP addressing," Performance President Paul Finke said. A side benefit of the system, Finke added, is a native firewall: Internet users can access only the Performance box and none of the other nodes on the IPX LAN.

"The dilemma for NetWare networks has been the need to put in a Unix box or futz with [NetWare Loadable Modules]," agreed Mike Ballard, an independent consultant in Potomac, Md., familiar with the Performance product.

"The surface of the NetWare world is just being scratched relative to the Internet," Ballard said.

While Performance's system supports Winsock 1.1-compliant software applications, it comes bundled with some Internet client software, such as the following:

- WinWeb, the free, graphical browser for the World-Wide Web from EINet in Austin, Texas.
- Eudora electronic-mail client.
- A file transfer protocol client, a gopher client and a news reader.

Version 1.0 of Instant Internet is scheduled to ship next month for $3,495 for a single LAN license. Performance will also offer a monthly lease option.

SUNWORLD '95



Where else can you learn how to put it all together and get the knowledge to manage complexity? Or see the latest products and services from Sun? Or share experiences and expertise with thousands of other users of Sun®, SPARC®, Solaris™ or complementary open systems technologies? Where else but SunWorld '95, the best source for the knowledge and information you need to compete in today's world of open systems technology.

Moscone Center • San Francisco
Conferences: May 23-25
Exposition: May 23-25
Tutorials: May 20-22, May 26-27

Putting it All Together for You at the Biggest SunWorld Yet!

- SunWorld Expo • SunWorld Conference Program
- The Solaris Developer and Networking Conference
- Sun Educational Services Tutorials • SunSoft Education Courses

sunworld 1995

4. Easy Ways to Get More Information

MAIL: Send this coupon to: SunWorld '95, c/o Mitch Hall Associates, 260 Milton Street Dedham, MA 02026

FAX: Fax this form to 617-361-9074

INTERNET:

MOSAIC on the World Wide Web: http://www.exporeg.com/sunworld

Email: sunworld@exporeg.com
solaris@exporeg.com

For general information and a registration form please put "Info" in the subject field and your email address in the body of your message. For any other inquiries, simply send us a message and place your email address in the body of your message.

PHONE: Call 800-265-3585 for more information.

SunWorld '95

Please Send Me More Information

- ❍ 3-day SunWorld Main Conference Program and Exhibits
- ❍ The Solaris Developer and Networking Conference
- ❍ Please send me more information about exhibiting at SunWorld '95

Name _____ Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Phone _____ Fax _____ Internet/Email _____

Computerworld

Illustration © Adam Cohen 1995

BOSTON CAREERS

WILL BE FEATURED IN COMPUTERWORLD'S MARCH 13 EASTERN EDITION.
DEADLINE: MARCH 9, 3PM

1-800-343-6474, x152

COMPUTERWORLD's Code of Ethics

1. Computerworld's first priority is the interest of its readers.
2. Editorial decisions are made free of advertisers' influence.
3. We insist on fair, unbiased presentation in all news and articles.
4. No advertising that simulates editorial content will be published.
5. Plagiarism is grounds for dismissal.
6. Computerworld makes prompt, complete corrections of errors.
7. Journalists do not own or trade in computer industry stocks.
8. No secondary employment in the IS industry is permitted.
9. Our commitment to fairness is our defense against slander.
10. All editorial opinions will be clearly labeled as such.


COMPUTERWORLD

Object standards accelerate

Microsoft blesses emerging standard

IBM pulls mainframe into new development role

Success strains SAP Support

All clears for telecommuting

COMPUTERWORLD'S EIGHTH ANNUAL SALARY SURVEY

CASH ON DELIVERY

WORDS WE LIVE BY.

When you pick up a copy of *Computerworld*, you know you're getting the most objective, unbiased news and information in IS. Our code of ethics guarantees it.

Why do we make such a big deal out of editorial integrity?

Because the words you read in *Computerworld* often have a dramatic impact on your business, your career, and your future.

You use this information to evaluate new products. To get a candid view of emerging technologies. To find out the inside story on corporate strategies. To decide whether to jump ship or stay in your current job. To get the edge on your competition.

In short, *Computerworld* is filled with the words IS professionals like you live by.

WORDS YOU WORK BY.

Week in and week out, our editors and reporters call it the way they see it – on issues ranging from network management to reengineering. They dig deeply to bring you the most accurate, comprehensive news in IS.

It's no wonder over 140,000 IS professionals pay to subscribe to *Computerworld* every week. Shouldn't you? Order today and you'll receive 51 information-packed issues. Plus, you'll get our special bonus publication, *The Premier 100*, an annual profile of the leading companies using IS technology.

Call us toll-free at **1-800-343-6474**. Or use the postage-paid subscription card bound into this issue.

You'll get the kind of straightforward, impartial reporting you can work by. You have our word on it.

COMPUTERWORLD



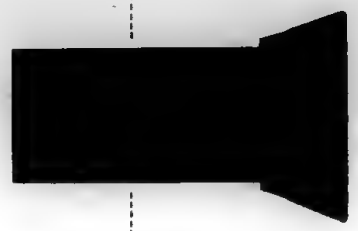
CLIENT/SERVER
PERFORMANCE

Only AS/400 Advanced Server
lets you run client/server applications
50% faster than competing PC LAN
and UNIX® systems.

(If only all your investments
could pay off so quickly.)

(If it isn't as fast, it isn't AS/400®.)

IBM and AS/400 are registered trademarks of International Business Machines Corporation. All other products and/or company names are trademarks or registered trademarks of their respective companies. © 1995 IBM Corp. UNIX is a registered trademark in the U.S. and other countries, licensed exclusively through the X/Open Company Limited.



FDDI ADAPTERS REMOTE OFFICE SOLUTIONS STACKABLE HUBS TOKEN RING ADAPTERS

WAN BACKBONE SOLUTIONS SWITCHING HUBS REMOTE OFFICE BRIDGES & ROUTERS PERSONAL OFFICE SOLUTIONS

WORKGROUP SOLUTIONS ETHERNET ADAPTERS CHASSIS HUBS BUILDING CAMPUS SOLUTIONS FDDI ADAPTERS

Why to switch.

Switching is the most cost-effective  way to add bandwidth to your network.

LinkSwitch 1200

How to switch.

It's easy, just add a switching  hub to your existing network.

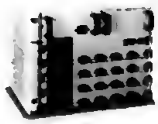
New LANplex 2500

When to switch.

Now. Because you can immediately  make better use of your network.

LANplex 6012

Where to switch.

Many times it's where you're  currently routing. You may need both.

New CELLplex 7000

Who to switch with.

3Com®—the switching market leader.

No ad could possibly answer all your switching questions. But because we pioneered high-speed switching technology, no other company can answer them like 3Com.

What's more, only we can meet all your network switching needs with our award-winning products.

It starts with our robust LANplex® 6000 switching hub that can anchor the networking resources of your campus backbone. Or, if your needs are on a departmental level, the new LANplex 2500 is a perfect performance booster. And if you need more bandwidth for your workgroups, we have the LinkSwitch™ family, which we offer as an integral part of our SuperStack™ system or as a module in the LinkBuilder® MSH™ multi service hub.

Plus, our CELLplex™ family of high performance ATM switches provides powerful ATM backbone performance and seamless Ethernet/ATM integration. As a matter of fact, our ATM switching hubs perform so well, they were recently awarded *Data Communications'* "Hot Products" award.

To find out more about the why, how, when, where and who of switching, call **1-800-NET-3Cnm** for our *Making Sense of Switching* kit.

3Com®

PCMCIA ADAPTERS CENTRAL SITE ROUTERS NETWORKS THAT GO THE DISTANCE

Leadership based on the 1994 Dataquest LAN Switching market report. Switching is just one part of 3Com's High Performance Scalable Networking strategy and tying it all together is "Planecm" Network Management.
©1995 3Com Corp (408) 764-5000. 3Com, LANplex, LinkBuilder, SuperStack, LinkSwitch, MSH CELLplex and Networks That Go the Distance are trademarks of 3Com Corp.

Workers slow to accept telecommuting

By Mitch Betts

A national survey of U.S. workers shows they like the idea of telecommuting but are skeptical about getting the information, documents and equipment required to get their jobs done at home.

Analysts and technology managers said that may be because the workers are unaware of technologies — such as the marriage of Integrated Services Digital Network (ISDN) and document imaging — that can give telecommuters equal access to corporate documents and data.

The survey "reflects misinformation rather than reality," said Gil E. Gordon, editor of the "Telecommuting Review" newsletter in Monmouth Junction, N.J. "Telecommuting doesn't succeed automatically. It does require some planning for information flows."

The poll by CBD Researeb & Consulting, Inc. in New York showed that 38% of those surveyed doubted they would "have access to the information and records I need." About a third said they could not do their job at home — period.

The survey sample was small, however. Half of the 356 respondents were white-collar workers and the other half were blue-collar workers not likely to be able to telecommute.

Meanwhile, firms such as Consolidated Edison, Inc. and Empire Blue Cross Blue Shield, both in New York, are cranking up pilot programs that give telecommuters the same access to customers and documents that office workers have.

Customer service from home

At Con Ed, three customer service representatives now handle their regular duties — responding to customer phone calls and correspondence — from home. IBM's CallPath computer-integrated telephony software routes customer calls to the telecommuters, while correspondence is delivered by imaging and workflow software from New York-based Sigma Imaging Systems, Inc.

In essence, the telecommuter links up to the company LAN and fetches the next available task, said Ed Glister, senior project manager in the customer operations unit. The only differences between in-house and remote users are remote users have ISDN connections and larger PC hard disks to hold more software, he said.

Later this month, Empire Blue Cross Blue Shield will begin testing the viability of telecommuting technology for health insurance claims examiners who transcribe data from document images into a mainframe database. The pilot will involve 16 workers, each processing an average of 250 documents per day using Sigma's imaging and workflow system.

Initially, Empire's pilot will keep the 16 workers in their regular offices, but they will be hooked up to the ISDN lines as though they were telecommuters, said Gillian Williams, director of advanced technologies at Empire.

Telecommuting traffic jam

A national sample of employees identified the Top 3 disadvantages of telecommuting:

I would not have all the equipment and supplies I need	44%
I would not have access to the information and records I need	38%
It would be harder to separate my work time from my personal time	36%

BASE: 356 RESPONDENTS (MULTIPLE RESPONSES ALLOWED)

Source: CDB Research & Consulting, Inc., New York

"It's a heads-down, data-entry job, so we have to make absolutely sure there is no reduction in productivity before we send them home," she explained.

In both cases, the ISDN Basic Rate Interface service is provided by Nynex Corp., New York's regional telecommunications carrier.

Glister and Williams said the key to Sigma's workflow system is that while a telecommuter is working on one document, it fetches a second and third document image into the telecommuter's in-box. The result is that images are transferred over ISDN lines with no waiting required.

Drawing the line

Glister said Con Ed will also study the management, legal and union issues surrounding telecommuting. The national poll highlighted another common concern: that telecommuting makes it hard to draw the line between work and home life.

Telecommuters must have the self-discipline to "turn off work and rejoin their personal life already in progress," Gordon said.

Over 750 **blue chip companies have adopted Hyperion software.**

So we're adopting the name for our company.

Hyperion

IMRS is now Hyperion Software.

The new name to remember for all your financial software.

Shiva enters remote ISDN territory

By Suruchi Mohan

■ Shiva Corp. recently joined the growing ranks of companies that provide Integrated Services Digital Network (ISDN) access to remote sites.

Shiva did so via a technology agreement with Sonix Corp., which is based in the UK. Under terms of the agreement, Burlington, Mass.-based Shiva and Sonix will codevelop a Basic Rate Interface (BRI) ISDN card for Shiva's LANRover/Plus remote access servers.

Under Shiva's plan, the ISDN connection will offer the following features:

- Access to all resources on a LAN.
- Access to the Internet and other on-line services for LAN users in an organization.
- The ability for branch offices to dial one another.

While Shiva is a newcomer in this arena, other companies have been in the business of remote access ISDN for about a year. They include Ascend Communications, Inc. in Alameda, Calif., Dynatech Communications, Inc. in Woodbridge, N.J., and UUNet Technologies, Inc. in Fairfax, Va.

So far, users who have adopted this technology report positive results. Anne McKereghan, controller at The Stephens Group, Inc., an advertising agency in San Jose, Calif., implemented an ISDN connection to the Internet early this year. Although it is too soon to quantify the benefits, McKereghan said the benefits of image speed and clarity "will offset the costs."

Price still too high for some

Mani Chhabra, who has had BRI ISDN for six months, agreed. Chhabra, who is software manager at BioMed Datis Corp., a health care information service in San Mateo, Calif., said it is a "very economical way to go for small to midsize companies that cannot afford T1 lines." He added, however, that for users who want to use ISDN as an efficient way of telecommuting, the entry point of approximately $1,000 per user is still too high.

Setting up a BRI ISDN connection at home, with one or two channels, requires the installation of an ISDN line. This might cost $50 to $100. A terminal adapter ranging in price from $595 to $995 is also required for each home connection, according to Barry Gilbert, president of Metric Technologies in Ashland, Mass. Telephone hookups can range from $30 to $100 vs. $15 to $30 for a regular dial-up line.

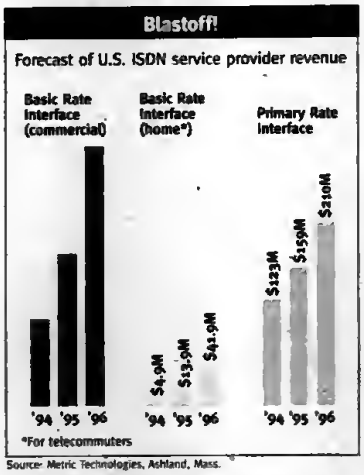
Getting the ISDN line from the telephone company can be a big challenge, said Tom Nolle, president of CIMI Corp. in Voorhees, N.J. This is a twofold issue, he said. In some residential neighborhoods there are "islands" of ISDN lines where small areas that have ISDN hookups are surrounded by areas that do not.

The second challenge is actually ordering the line from the phone company, Nolle said. Many times, would-be ISDN customers reach an operator who knows little about ISDN. When repeated calls do not yield a knowledgeable person, some users give up in disgust.

This ineptitude on the part of the regional Bell operating companies is partly to blame for the slow growth of the ISDN market in the U.S., Nolle said.

Another factor is that Internet service providers charge more for ISDN access than for 14.4K bit/sec. access. For example, when UUNet makes its ISDN service for the Internet available to individuals, it will charge a little more for the service, a spokesman said. Prices have not yet been set.

Another problem is that BRI ISDN is great for file transfers but does not work as well for Telnet. This is because a 56K bit/sec. line brings information onto the screen very rapidly, and the screen moves too fast for users to follow.



Now, **accounting software that works as well as the most successful financial reporting software.**

Introducing

Hyperion

Financials

An integrated client/server solution for financial management to drive your business into the next century.

Ascend Communications, Inc. has announced Pipeline EtherFrame, an Ethernet-to-frame-relay access router, and EtherFrame, software for Ascend's Max wide-area hub.

According to the Alameda, Calif., company, Pipeline EtherFrame lets remote users access corporate networks and the Internet. The router comes standard with internal channel and data service units and two independent 56K bit/sec. channels.

EtherFrame software lets Max hubs support frame relay along with analog, Integrated Services Digital Network switched and leased-line traffic. The hub can also act as a frame-relay wide-area gateway for local and long-distance carriers and internet providers.

Pipeline EtherFrame costs $1,695, and EtherFrame costs $1,000.

▶ *Ascend Communications*
(510) 769-6001

Network Resources Corp. has announced the MultiGate Switch, an Ethernet switching hub.

According to the San Jose, Calif., company, the MultiGate Switch operates at 10M bit/sec. on 12 Ethernet ports and provides a high-speed uplink for connection to a server or backbone.

The ports can be occupied with any mix of 10Base-T, 10Base-2 and 10Base-F modules. Users can install the switch for Ethernet media, routing and network management.

Prices start at $7,995 for a base unit.

▶ *Network Resources*
(408) 383-9300

Adaptec, Inc. has announced 10 Asynchronous Transfer Mode (ATM) network interface cards.

According to the Milpitas, Calif., company, the cards operate at 155M bit/sec., come bundled with ATM communications software and include a protocol conversion feature that lets non-ATM traffic traverse ATM networks. The cards come in three styles: Server/High Performance, for network servers and corporate computing resources; PowerDesktop, for departmental servers and workstations; and Desktop25, for PCs.

Prices range from $349 to $995, depending on whether the systems are based on Peripheral Component Interconnect bus, SBus or IBM's Micro Channel Architecture.

▶ *Adaptec*
(408) 945-8600

Frontier Software Development, Inc. has announced Netscout Manager 3.3, with support for monitoring network traffic generated by specific applications such as Mosaic, Lotus Development Corp.'s CC:Mail and Notes and others.

The Chelmsford, Mass., company said Netscout Manager 3.3 can be used to track LAN and WAN bandwidth use by application and by department or user.

It costs $3,995 for Ethernet and up to $4,995 for WAN monitoring.

▶ *Frontier Software Development*
(508) 851-5700

Cross International Corp. has announced Netpage, a paging system for Novell, Inc. NetWare and NetBIOS PC networks.

According to the Boulder, Colo., company, Netpage lets users send one or more lines of information that will appear on the bottom of all user screens. This can include multicolor flashes, beeps or .WAV music files for high-priority messages.

Users can also send a note or telephone number to a pager from the desktop. The product can record the date and time of each message in a master file for administrative purposes.

Prices range from $99 to $299, depending on the number of users.

▶ *Cross International*
(303) 440-7313

Micom Communications Corp. has announced the NetRunner Integration Router (I-Router) family of routers.

According to the Simi Valley, Calif., company, the I-Router family features IP/IPX routing and integrates remote Ethernet LAN traffic with voice, fax and legacy data over 9.6K and 128K bit/sec. connections.

The routers are configured for traditional multiprotocol routing, with optional toll-free voice and fax integration. The products learn all network addresses and optimize use of wide-area bandwidth.

Prices range from $2,450 to $12,000.

▶ *Micom Communications*
(805) 583-8600

Informer Data Security, Inc. has announced Secure Access Management software (SAM) 2000 2.0, security software.

According to the Garden Grove, Calif., company, SAM 2000 2.0 includes a switching capability that lets calls be routed from a pool of modems to the appropriate network services.

Features include real-time audit trails, password aging, tracking of the number of log-on attempts and temporary user profiles.

SAM 2000 2.0 comes in 8-, 16-, 32-, 64-, 128- and 256-line versions, with prices starting at $400 per line.

▶ *Informer Data Security*
(714) 379-4480

A financial system that reflects the way you do business.

Flexibility to meet the toughest business challenges.

Immediate on-line access to any view of your business, anywhere in the system.

Significantly more productive than current systems. Fast installation. Easy maintenance.

You'll need fewer reports and spend less time preparing each one.

More efficient accounting. More time for analysis.

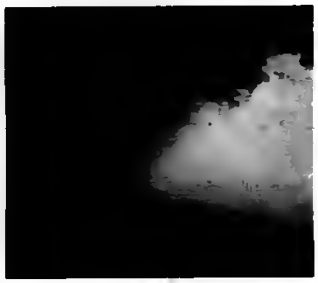
Hyperion ledger
Hyperion tools
Hyperion reporting
Hyperion payables
Hyperion admin

Hyperion software

The new name to remember for all your financial software.
For more information call Carolyn Simon in Stamford, Connecticut.
1·800·286·8000

When Data Is Lost In Minutes, It's An Act Of God.







When Data Is Recovered In Minutes, It's An Act Of EMC.

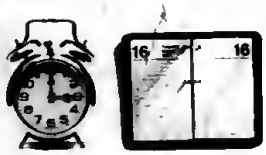
By the end of this sentence, an unforeseen disaster could disrupt your business. But don't worry. By the end of this ad, you won't be concerned.

Introducing Symmetrix™ Remote Data Facility (SRDF).

A revolutionary mainframe solution from EMC that ensures continuous availability of your business information.

Now, with SRDF, a recovery process that took days is reduced to minutes because all your data is instantaneously duplicated at a remote location, as of the last transaction, making a complete copy available in the next building, state, country or continent.





Disaster recovery in minutes, not days.

And that means no time-consuming rehearsals since SRDF is automatic and doesn't require people, eliminating human error.

No CPU overhead or host intervention.

No loading tapes onto trucks for a costly road trip.

Simply bullet-proof, fault-tolerant recovery that doesn't degrade on-line performance. Or your company's bottom line.

Symmetrix Remote Data Facility. When it comes to keeping your business running through anything, it's nothing short of a miracle.

For more information, please call 1-800-424-EMC2, ext. 201.

DATA RECOVERY IS IMPROVED BY A FACTOR OF EMC²

THE STORAGE ARCHITECTS

EMC² and ICDA are registered trademarks, Symmetrix and THE STORAGE ARCHITECTS are trademarks of EMC Corporation. ©1995 EMC Corporation. All rights reserved.

HDS follows IBM's lead with tape library

By Craig Stedman

■ Hitachi Data Systems Corp. is starting to march to its own drummer in the mainframe disk storage market. But when it comes to a new line of tape libraries, HDS is sticking closer to IBM's tune.

The RAID disk array HDS introduced this month goes far beyond any imitation of IBM [CW, Feb. 13]. But the company is pitching a pair of automated tape devices, also introduced this month, purely as plug-compatible alternatives to IBM's 3495 and 3494 libraries. HDS is taking this tack even though IBM is only a distant second in library sales to Storage Technology Corp. in Louisville, Colo.

Due to ship in the second half of the year, the HDS Media Manager series will piggyback on IBM's storage management software.

"As far as the mainframe is concerned, it will be talking to an IBM subsystem," said Ken Spear, director of storage systems marketing at HDS in Santa Clara, Calif. HDS will use claims of higher performance and its fault-tolerant design, which includes dual robots on the high-end library, as selling points against IBM, he added.

Measuring up

HDS's high-end Media Manager 7450 library maxes out at 52 ft. in length, while IBM's 3495 requires 92 ft. in its full linear sprawl. However, IBM can fit 18,000 cartridges into its big library, compared with about 8,700 for HDS. IBM would be in the 60-ft. range at that smaller capacity.

Mainframe boundaries

However, the emulation approach will limit HDS's potential audience in the mainframe market. IBM did increase its share of mainframe library shipments from 9% in 1993 to 20% last year, but StorageTek — which provides its own tape management software — was still the dominant vendor with a 66% share, according to International Data Corp. in Framingham, Mass.

First Security Corp., a banking company in Salt Lake City that uses HDS disk subsystems, has been impressed with their reliability. But the bank's tape storage is handled by a pair of StorageTek silos that are being upgraded to 36-track drives, said Erik Jensen, vice president of computer operations at First Security's information technology unit.

"The chance that we would switch would be minuscule," Jensen said. First Security uses IBM's Data Facility Storage Management Subsystem (DFSMS) software for managing disk operations, but it relies on StorageTek's Host Software Component code on the tape side, Jensen added.

The bright side

On the other hand, the DFSMS support built into HDS's Media Manager libraries could be a point in HDS's favor at Pizza Hut, Inc. in Wichita, Kan. Pizza Hut may look at bringing in its first automated libraries at year's end, and it also is moving to implement DFSMS throughout its data center, said Lyle Myers, a senior systems programmer at the Pepsico, Inc. subsidiary.

"Right now, we have several sets of rules that manage our storage, and it's hard to keep track of all of them and get them to fit together," Myers said. Pizza Hut, which has 180G bytes worth of HDS disks in place, hopes to see some good price competition between IBM and HDS on the library front, he added.

HDS is entering the library market eight years after StorageTek and almost three years behind IBM, making it "difficult to come out with something different than what's already out there," said Fara Yale, an analyst at Dataquest, Inc. in San Jose, Calif. Parent company Hitachi Ltd. already sells proprietary libraries with a linear design similar to IBM's in Japan, and retrofitting those to support MVS and DFSMS was the easiest path into

HDS, *page 104*

The book on Media Manager
HDS's new tape library offering includes the following features:

	Media Manager 7430	Media Manager 7450
Maximum number of cartridges	3,016	8,751
Tape drives	1 to 8	4 to 32
Control units	1 to 4	2 to 8
Cartridge mounts per hour	200	400
Scheduled availability	Fourth quarter	Third quarter
Starting price	$90,000	$275,000

Middleware gives Chase unified view of customer data

By Thomas Hoffman

Until recently, retail banking functions at The Chase Manhattan Bank NA were organized around its lines of business such as mortgage, credit card and auto financing. That approach, however, effectively stymied customers seeking one-stop banking across multiple products or services.

For example, a customer of the New York-based bank could call one of Chase's three regional telephone centers for an update on his checking account balance, but he had to place a separate call to Chase's credit-card unit to get information on his credit limit.



Chase's Michael Levine *says MDP lets the bank decouple data from the databases*

Bringing it together

"It was very difficult to get information out of the vertically integrated systems [because] the data was so tightly coupled to each unit," said Michael Levine, vice president of regional banking systems at Chase's New Hyde Park, N.Y., office.

In response, Chase has melded its disparate systems together through a middleware technology project called Fusion. The project — expanded to include a redesigned workstation interface for Chase's branch service representatives — was launched last June as part of a broader customer service enhancement program.

Prior to the Fusion project, Chase had invested $20 million in IBM PS/2 PCs and servers for its 300-plus branches in the Greater New York area in a project called MetroLAN. The MetroLAN effort did allow branches to communicate seamlessly with one another through a standardized network. However, customer service reps were still unable to extract credit card and other account information from the IBM DB2 and other databases housing nonbranch data at its regional data center in New Hyde Park.

So after examining a range of middleware options, the bank decided to purchase MDP (message-driven processor) from Early Cloud & Co. in Middletown, R.I. The package was designed to pull legacy data from disparate systems. "What Early Cloud gave us was the ability to decouple data from the databases," Levine said.

Although Chase is not the first bank to push ahead with virtual banking services for its customers, it appears to have a leading-edge middleware approach, industry analysts said.

Linking up

Based on the early success of its private banking middleware project, Chase is considering a similar scheme to link its dozen IS systems to one another.

Keeping it connected

"There is a tremendous amount of interest in one-stop shopping in the banking industry right now," said Andrew F. Mayer, a senior manager in the financial services industry consulting practice at Ernst & Young in New York.

Mayer said the one-stop shopping craze, at least in financial services, has been driven primarily by leading-edge brokerages and mutual funds groups such as Boston-based Fidelity Investments Co. and New York-based The Dreyfus Corp., a subsidiary of Mellon Bank Corp. in Pittsburgh.

The Early Cloud software complies with IBM's Messaging Queueing Series, which is a messaging architecture for intersystem communications. Because of this compliance, Chase has avoided the need to make major modifications to its legacy systems. These included IBM CICS applications that run on Amdahl Corp. and IBM ES/9000 mainframes, Levine said. Instead, Early Cloud's MDP was designed to enable CICS software to act as enterprise servers of online transaction processing data.

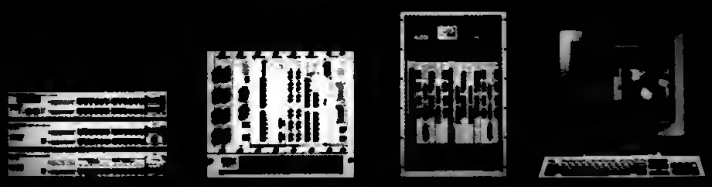
Last March, Chase began installing Early Cloud under a client/server configuration between its telephone center and branch databases. By September, Chase had completed real-time data links between its telephone centers, branches and private banking units.

It would have taken Chase up to two years to install separate interfaces between each of the disparate systems, Levine estimated. Instead, the fusion of Chase's private and branch banking activities, with the Early Cloud package, took only six months.

[illegible] You Can Look Forward To.



SYNTHESIS



The Complete Networking Solution™

P.O. Box 5005, Rochester, NH 03866-5005

Massachusetts drives 'motor voter' system

State implementing statewide voter-registration network

By Mitch Betts

While a handful of states are stubbornly resisting the federal "motor voter" registration law, Massachusetts is forging ahead with an ambitious, $5.2 million statewide system to implement the statute.

Under the National Voter Registration Act, which went into effect this year, states must allow citizens to register to vote when they get their driver's licenses renewed or obtain welfare benefits.

California, Illinois, Pennsylvania and South Carolina are opposed to the law, in part because they see it as an "unfunded mandate" from Washington that they cannot afford. The U.S. Department of Justice has sued all four states for refusing to comply.

On the other hand, some states already have exemplary systems, making it easier for citizens to register to vote, said Rebekah Evenson and David Plotkin, analysts at Human Serve, a New York-based campaign for voter registration. They cited Kentucky, Georgia, Oregon, Texas and Washington state as having excellent voter-registration systems and tagged Massachusetts as an up-and-comer.

Last October, the Massachusetts Secretary of State's office awarded a three-year, $7.6 million contract to Unisys Corp. to build a "central voter registry." It will feature a direct communications link to each of the commonwealth's 351 towns and cities.

Key architectural components include a Unisys U6000/550 midrange system as the host, Oracle Corp.'s Oracle 7 database software and Nynex Corp. frame-relay links to PCs installed in each town hall.

Robert Moriarty, project manager for the Central Voter Registry Information System in Boston, said the state has an aggressive timetable for rolling out the system. First, the system will be tested in six towns and then in 20 towns. "We'll bombard the system [with an excessive workload] and try to get it to crash so we can see where the problems are," he said.

An additional 40 towns and cities per week will be added so that all 351 will be on-line by July 1. Massachusetts will then be ready for the expected onslaught of registrants expected for the presidential primary in March 1996, Moriarty said.

In essence, the state will have a single voter registration database available for real-time updates in every town, he said. Furthermore, the voter database and the network can be used for other applications, including a statewide census and jury-selection pools.

Moriarty said the price tag for design and installation was $5.2 million; annual operating costs will be $2 million. Running a paper-based "motor voter" system would have cost $6 million a year and "would have been a nightmare," he added.

Some motoring, some braking

Thirty-six states are implementing "motor voter registration" systems, while a handful are resisting the change for political reasons



Source: Human Serve voter registration campaign, New York

HDS follows IBM tape library lead

CONTINUED FROM PAGE 101

the market for HDS.

Demand for the high-end 7450 Media Manager will likely be modest because demand for big libraries is flattening out, according to Yale and Paul Wolfstaetter, an analyst at Gartner Group, Inc. in Stamford, Conn. But the smaller 7430 model could be more successful as a library for low-end mainframes and midrange systems. "No one has a lock on that market yet," Wolfstaetter said.

> "As far as the mainframe is concerned, it will be talking to an IBM subsystem."
> — Ken Spear, HDS

Additional support

HDS plans to start adding support for the AS/400 and various Unix systems to the 7430 later this year as part of a push into nonmainframe storage markets that will also include its disk arrays, Spear said. "Our strategy is to walk before we run," he added. "We're starting out in markets that we know, but we can't grow without expanding beyond the mainframe."

RedWood branches out

Storage Technology Corp. is hoping to persuade more corporate users to hug its RedWood than it originally let on.

StorageTek had painted RedWood — a new high-capacity tape drive supporting cartridges of up to 50G bytes — as a niche product aimed at government security agencies and seismic processing concerns.

But the Louisville, Colo., company widened its marketing vision to include LAN backup, imaging, multimedia and other commercial applications when it introduced RedWood this month.

At $162,000 for a single drive with Escon support, RedWood is three to four times more expensive than conventional 3490 technology, acknowledged Rob Niebohr, director of tape storage marketing at StorageTek. He added that commercial shops are not likely to buy more than a handful of RedWoods for storing their largest data sets.

But the helical-scan recording technology used by RedWood was less damaging to the tape in testing than expected, leading StorageTek to view the high-capacity device as useful "for more than just lunatic-fringe things," Niebohr said.

Fara Yale, an analyst at Dataquest, said StorageTek is getting "very creative" in trying to expand RedWood beyond its original niche. However, RedWood's commercial success will depend in part on when IBM ships its much-publicized New Technology Prototype (NTP) high-capacity drive "and what features it has," she added.

IBM is working on a capability that would allow users to stack multiple logical tape volumes on a single NTP drive, but that is not expected to be included when the MVS version of the product is ready for shipment late this year [CW, Feb. 6].

— Craig Stedman

Briefs

CA seals several licensing deals

Computer Associates International, Inc. has announced several significant licensing contracts it has landed in recent weeks. L'Oreal S.A., the Clichy, France, cosmetics group, has announced it will standardize on CA-Openingres as its relational database management system on Unix servers and CA-OpenRoad for its client/server application development environment.

In a separate contract, the South Australian state government has standardized on CA-Masterpiece/2000 for all of its client/server financial analysis needs as part of a recent five-year, multiplatform license agreement. In unrelated contract wins, CA has reached a multiyear license agreement for its CA-ManMan/X manufacturing package with TRW, Inc.'s Rack & Pinion Division in Rogersville, Tenn. CA also signed San Jose, Calif., information services provider Litton Computer Services to a worldwide enterprise software agreement. Terms of the contracts were not disclosed.

ISSC signs outsourcing deal

IBM's **Integrated Systems Solutions Corp.** subsidiary entered a 10-year, $100 million contract with Minneapolis-based Ceridian Corp. Ceridian provides payroll, tax filing and human resources services to corporate customers including IBM. The contract calls for IBM to provide payroll processing for Ceridian and for the two companies to jointly market Ceridian services.

Mexicana Airlines goes Unisys

After a five-month stint on British Airways' IBM-based reservations system, **Mexicana Airlines** has decided that it will convert back to **Unisys Corp.**'s USAS reservation system.

COMPUTER PRESS ASSOCIATION READER AWARDS BALLOT

SEND OR FAX ENTRIES TO COMPUTER PRESS AWARDS, 2 FLOYD DRIVE, MOUNT ARLINGTON, NJ 07856. FAX ENTRIES TO (201) 663-5140.
ALL NOMINATED ENTRIES MUST HAVE APPEARED IN 1994. NOMINATIONS MUST BE RECEIVED BY FEBRUARY 28TH.

FAVORITE PUBLICATION

Publication:

Broadcast/Appearance Date:

Article or Series Name:

Author/Host:

Remember, you can vote for a television program, or on-line service, too.

BEST INSTRUCTIONAL OR EDUCATIONAL ARTICLE OR SERIES

Publication:

Broadcast/Appearance Date:

Article or Series Name:

Author/Host:

BEST FEATURE OR REVIEW

Publication:

Broadcast/Appearance Date:

Article or Series Name:

Author/Host:

FAX ENTRIES TO (201) 663-5140

Name _____
Title _____
Company _____
Address _____
City/State/Zip _____
Phone (Voice) _____
Phone (Fax) _____

OPTIONAL

Age ___ Sex ❑M ❑F
Income: ❑$25,000-$40,000 ❑$40,001-$60,000 ❑$60,001-$75,000 ❑$75,001-$100,000 ❑Over $100,000

YES! SIGN ME UP AS A CPA ASSOCIATE MEMBER FOR ONLY $30.

SPECIAL OFFER! Become a CPA Associate Member. Join now for only $30, and save over 50% (Regular Membership fee is $75)! Associate Members receive the CPA Network News, a CPA membership card and member directory, plus access to The CPA's BBS.

MC/Visa Number _____ Exp. Date: _____
Or enclose a check made out to "Computer Press Association"

CW 123

PLEASE
PLACE
STAMP
HERE

MR. JEFF YARLON

PRESIDENT

3 FLOYD DRIVE

MT. ARLINGTON, NJ 07856





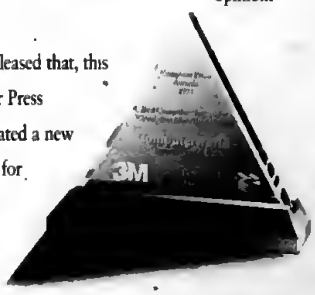
Nearly all editorial awards are decided by committees of experts who sit and review entries and use their best judgment to decide which publication or article is best. There is nothing wrong with this process — and it has certainly produced many awards for *Computerworld* — but, frankly, the opinions of our readers are more important to me than the opinions of experts. It is readers, after all, who are best able to judge the quality and usefulness of the material they read. And it is readers — not experts — for whom we write.

So I am very pleased that, this year, The Computer Press Association has created a new category of awards for their Tenth Annual Computer Press Awards: "The CPA Reader-Chosen Awards." These awards will be decided by the votes of publication readers. It is your chance to make your opinions count. I, for one, will be very interested in what you have to say.

To make your voting easy, we have provided a copy of the official ballot. You can fill it out, fax it in, or drop it in the mail.

However you do it, I encourage you to vote. The computer publication editors of America are waiting to hear your opinion!

Bill Laberis
Editor in Chief



Tenth Annual Computer Press Awards, 1995

The Computer Press Awards, co-sponsored by 3M Data Storage Products and the Computer Press Association (CPA), honor the top journalists who excel in their coverage of information technology. As the oldest and most coveted honor of its kind, the CPA provides a forum for technology journalists to be recognized by their peers.

COMPUTERWORLD

These are the stories we have submitted for review by the CPA. Please feel free to nominate these, or any other articles you've enjoyed during the year.

Instructional or Educational Articles or Series

- Guide to PC Support; *Kevin Burden, Stephan Clancy, Robert Johnson* (Dec. 5th)
- Guide to E-Mail; *Avery Jenkins, David Marshak* (Oct. 24th)
- Guide to 32-bit Operating Systems; *Jonathan Eunice, Mike Sullivan-Trainor, Garret Ray* (Apr. 11th)
- VIRUS; *Phillip Zakas* (July 11th)
- Software Product Review: Test Drive; *Jeff Angus, Al Giovetti* (Nov. 14th)
- Software Product Review: Test Drive; *Garret Ray* (Dec. 12th)

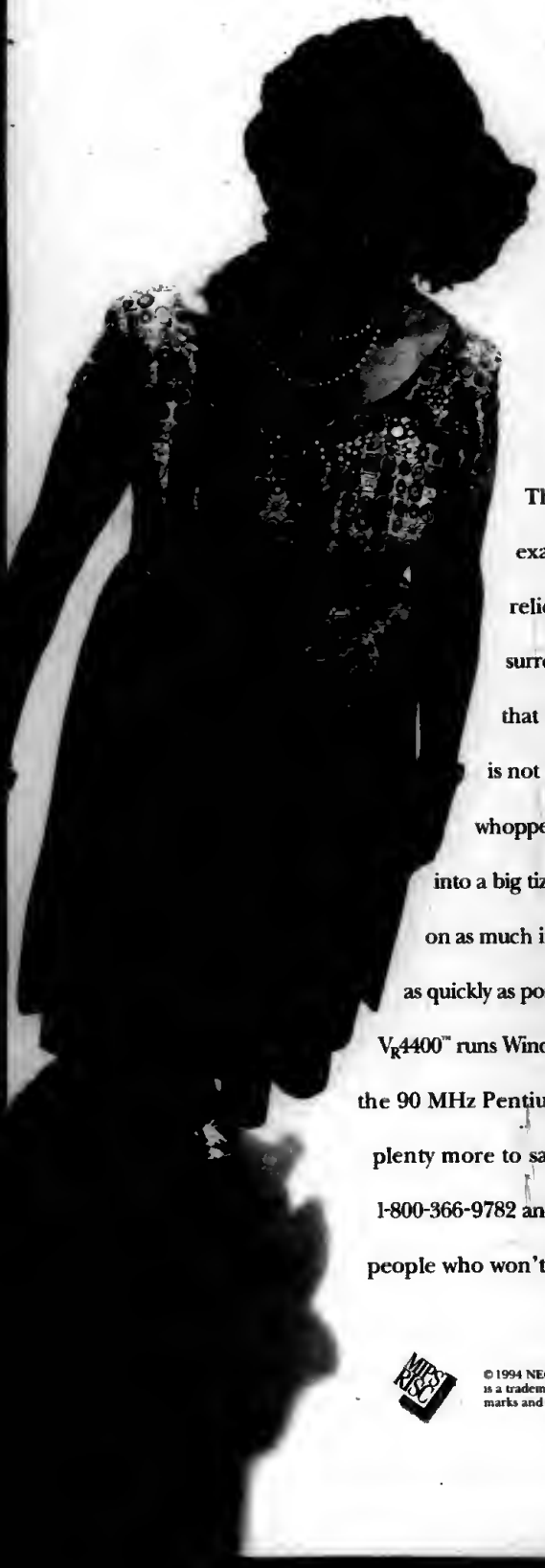
Features or Reviews

- High Tech Wagering: Jackpot or Jeopardy; *Joe Maglitta* (Feb. 7th)
- Gays at Home in High Tech; *Ellis Booker* (Sept. 26th)
- Demonstrating Value of Technology; *Alice LaPlante* (August 15th, Oct. 3rd, Oct. 31st)
- Is COBOL Dead? *Alan Pursell, John Cunningham* (April 25th)
- Decree: Deal or Dodge? *Stuart Johnston, Mitch Betts* (July 25th)
- Migration Costs Stoke User Anger; *Rosemary Cafasso* (May 16th)



Good move. You chose a system with a Pentium™ processor instead of NEC's MIPS RISC. Hold it, you run Windows NT,™ remember? Okay, so you made a little mistake. Whoops, no more expense account. Now the bank owns the convertible. Friends scorn you. Cheer up, mommy and daddy haven't rented out your old room yet.





The fact that your old bedroom is still there—exactly the way you left it—should provide some relief. But how are you to maintain your dignity surrounded by shag carpet and bowling trophies? Surely you realize that selecting a Pentium or PowerPC™ system to run Windows NT is not a minor mistake. Like spelling potato incorrectly. No sir. A whopper like choosing the wrong processor can throw your whole life into a big tizzy. Well there is a way to avoid your old curfew. Get your hands on as much information about NEC's V_R-Series MIPS RISC microprocessors as quickly as possible. What will you learn? NEC's 200 MHz V_R4400™ runs Windows NT up to three times as fast as the 90 MHz Pentium processor. Look, we've got plenty more to say. So call NEC Electronics Inc. at 1-800-366-9782 and ask for Info Pack #181. The only people who won't be happy are your parents.

MICROSOFT® WINDOWS NT™ COMPATIBLE

NEC

MIPS RISC

© 1994 NEC Electronics Inc. Microsoft and the Windows logo are registered trademarks and Windows NT is a trademark of Microsoft Corporation. Pentium is a trademark of Intel Corporation. All other registered marks and trademarks are property of their respective holders.

OSF/1 makes Digital a player in Unix game

By Neal Weinberg

■ Digital Equipment Corp. has had an uneasy relationship with Unix ever since former Chief Executive Officer Kenneth Olsen shunned the operating system as a poor relation to the vaunted VAX/VMS.

"They treated it like the crazy aunt in the attic," said Jonnthan Eunice, an analyst at Illuminata in Hollis, N.H.

But Digital has gotten serious about Unix. The company put its engineering muscle to work and developed an implementation of the Open Software Foundation's OSF/1 kernel. Digital's OSF/1 version has gone from a standing start two years ago to running nearly 3,000 applications. And the company projects that its annual OSF/1 sales will hit $1 billion by year's end.

"Digital went out and developed a top-class Unix operating system," said Jim Brennan, an analyst at WorkGroup Technologies, Inc., in Hampton, N.H.

Although it is a strong contender technologically, Digital's OSF/1 version is fundamentally on a par with Unix offerings from Hewlett-Packard Co., Sun Microsystems, Inc. and IBM. Each has its own strengths and weaknesses.

For example, Digital is tops in storage management, with a file system that is "the best you'll find," Eunice said. But it lags in systems management features, and its character-based user interface is weak, according to a recent report by D.H. Brown Associates, Inc. in Port Chester, N.Y.

Even after Digital decided it could not afford to ignore the Unix market, the company was slow to come out with a competitive product, Brennan said. As a result, Digital is still fighting for name recognition in the Unix market.

A good chunk

For Digital's second quarter, which ended Dec. 30, 1994, OSF/1 sales were $187 million. That represented 10% of total product sales for the company.

A year ago, when Saks Fifth Avenue was making decisions on how best to move to client/server, Chief Information Officer Robert Ramsden looked at all the major vendors.

Digital did not make the short list. "They weren't really in the mainstream in my opinion at that time," Ramsden said. "DEC wasn't really a player."

Tom Smith, senior systems engineer at Martin Marietta Corp.'s information systems group in Syracuse, N.Y., looked at Digital's OSF/1 about a year ago but went with Sun and HP.

The deciding factor was that the computer-aided design applications the company had selected as standard tools were not available on the Digital platform. "The box seemed to be a good performer. I have no complaint about that," Smith said. And interoperability was not a serious issue.

Still, Digital has scored a number of Unix wins, mostly from its installed base.

"We wanted to migrate to nonproprietary open systems," said Rod Barnett, director of systems support at Flav-O-Rich, Inc. in Lonisville, Ky. As a longtime customer, Flav-O-Rich said it was comfortable sticking with Digital.

Without a strong business reason to change hardware vendors, Barnett said the logical choice was OSF/1. His system has been up and running for four months, and outside of some minor "tuning issues," he has been "quite pleased with the overall performance."

Last in line

The problem for Digital now, Eunice said, is having to play catch-up. "It's tough being fourth to market. That's not an enviable position."

Strength in clusters

Digital is shooting for availability of a VMS-style Unix cluster file system by mid-1996.

Eunice said it was only last August — when Digital came out with OSF/1 Version 3.0 — that the company had all of its Unix ducks in a row. "That was the last day you could say that Ken Olsen's anti-Unix feeling persisted in any degree."

Today, Brennan said, Digital's problem is no longer the technology or even the number of applications, which he says has reached a critical mass. The problem appears to be Digital's marketing.

"The information we have indicates that during 1994 we weren't seeing Digital very much in competitive situations," Brennan said. The company is having success with the installed base in the U.S. and with customers in Europe. "There is a more positive view of Digital abroad," Brennan said.

Digital has acknowledged that it practiced "stealth marketing" in the past but said it is addressing the problem with new advertising and a more aggressive approach.

The wild card for Digital is its 64-bit Alpha hardware platform. Alpha's speed was the deciding factor for Guaranteed Overnight Delivery in Kearney, N.J., which recently went with OSF/1, according to CIO Michael Irwin.

And Paul Beck, manager of information processing at Manitowoc Engineering Co. in Manitowoc, Wis., said Alpha's horsepower was the reason his company selected OSF/1 for inventory, order entry and accounts receivable functions. "Why not pick the one with the best power?" Beck asked.

Furthermore, by going to 64-bit technology, Beck said he will not have to make the change down the road, which he would have to do if he had selected vendors using 32-bit systems.

[redacted]

Winchester Systems, Inc. has announced the FlashDisk SCSI series of RAID disk arrays for open systems.

According to the Woburn, Mass., firm, FlashDisk provides 2,200 disk read/write operations per second, per disk controller. It is targeted at databases, transaction processing, multimedia and imaging.

The product provides RAID Levels 0, 1, 3 and 5 data redundancy with hot spare automatic data rebuild and hot swap online drive replacement.

Prices start at $5,250 for a FlashDisk SCSI with 1G byte of storage and 16M-byte cache in a tabletop enclosure for workstations.

▶ *Winchester Systems*
(617) 933-8900

I/O Concepts has announced X-Direct Multi-Host Coax Gateway.

According to the Bellevue, Wash., firm, the X-Direct Multi-Host Coax Gateway lets Unix workstations connect to as many as seven mainframe hosts per SCSI interface. A GoScript scripting language automates TN3270 transactions. LU printer emulation software also comes with the card and process standard LU1 or LU3 data streams.

The product comes in a workstation or stand-alone version. The stand-alone version costs $5,000, and the workstation version costs $500. Coax cards range from $1,400 to $2,800.

▶ *I/O Concepts*
(206) 450-0650

Pennant, The IBM Printing Systems Co., has announced the 3900-0W3 advanced function printer.

According to the Southbury, Conn., firm, the 3900-0W3 is a high-speed, high-volume continuous forms printer that can be upgraded to the top-of-the-line 3900 Wide Duplex printer from Pennant.

Features include fast decompression for printing of images, graphics and bar codes. Users can print up to four logical pages on a physical sheet.

Prices start at $255,000.

▶ *Pennant*
(203) 262-3939

Sinper Corp. has announced TM/1 Perspectives 2.0, on-line transaction processing software.

According to the Warren, N.J., firm, TM/1 Perspectives 2.0 increases the speed of data consolidations and the flexibility of consolidation paths, ensures data consistency, lets multiple users work on the same base of data and presents data in many perspectives.

The product uses Microsoft Corp.'s Excel or Lotus Development Corp.'s 1-2-3 spreadsheets as its front-end interface. Features include data query control, context-sensitive help, handling of 16 dimensions and the ability to stack dimensions as rows and columns.

TM/1 Perspectives 2.0 costs $795.

▶ *Sinper*
(908) 755-9880

1776, Inc. has announced 1776 Multi-Host, software that permits two The Santa Cruz Operation systems to share resources.

According to the Los Angeles company, 1776 Multi-Host provides fault-resilience and high performance for mission-critical systems.

Users can be switched from one server to the other while the system is running, and either server can be rebooted without affecting the other.

1776 Multi-Host costs $2,695.

▶ *1776*
(310) 215-1776

CompuAid has announced Data Structure Extraction (DSE), data extraction software.

According to the Santa Monica, Calif., company DSE extracts and supplies the data structure information present in standard SQL join statement specifications. With this information, products using DSE can feature increased flexibility and accuracy, transparent access to legacy and nonrelational databases, multitable updates and basic object-oriented processing capabilities.

DSE costs $29,500 for a one-time, royalty-free license.

▶ *CompuAid*
(310) 395-6889

AIWA America, Inc. has announced the AL-D210 and AL-D220 AutoLoaders, tape backup autoloaders.

According to the Mahwah, N.J., company, the autoloaders automate nightly tape backup operations including automatic tape insertion, removal and rotation of up to 17 tape cartridges.

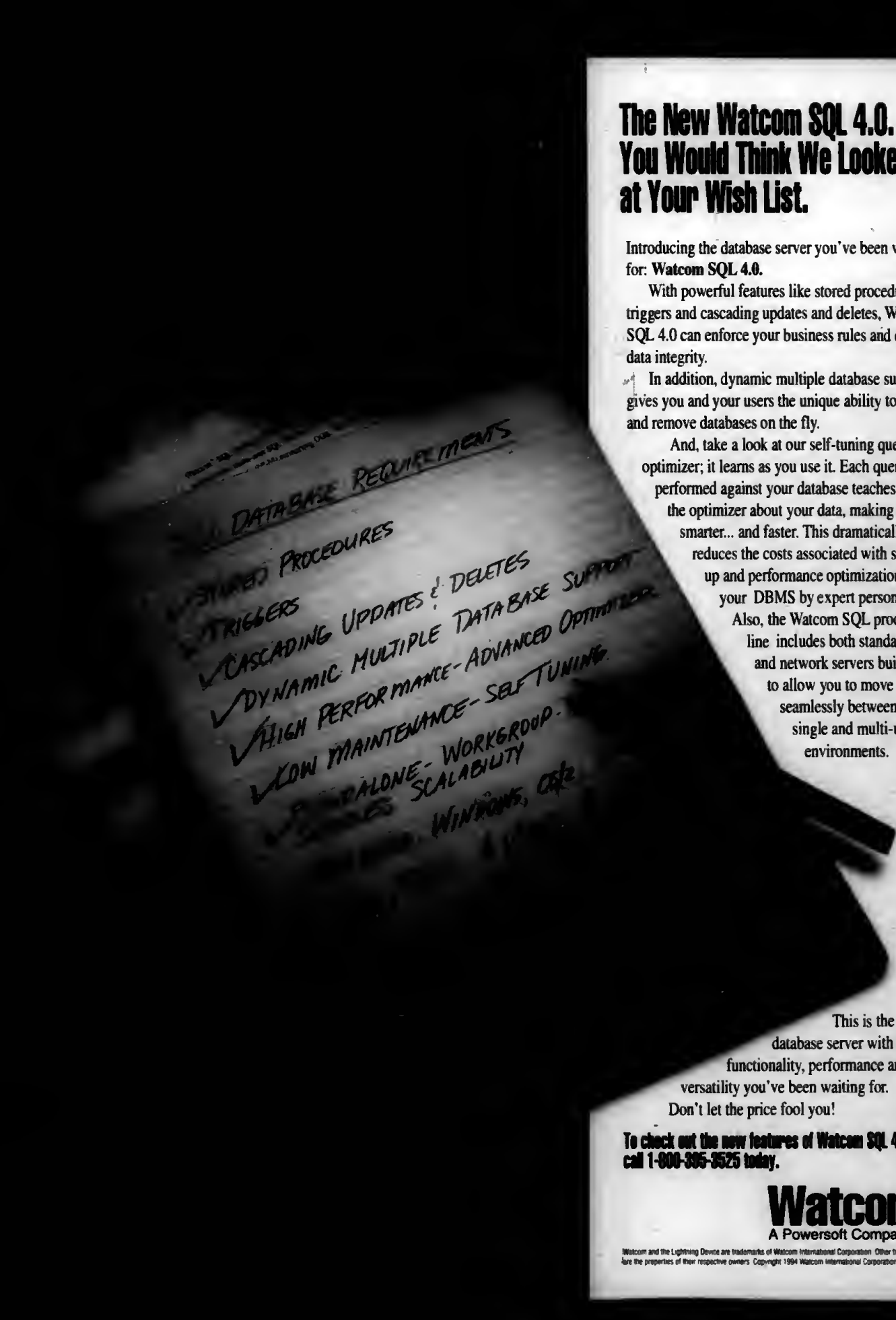
The AL-D210 is SCSI-based and comes with one tape drive. The AL-D220 features two tape drives for increased data transfer. The autoloaders work with servers supporting Unix, Novell, Inc.'s NetWare, IBM's OS/2, Microsoft Corp.'s Windows NT and the Macintosh.

The AL-D210 costs $6,995, and the AL-D220 costs $8,995.

▶ *AIWA America*
(201) 512-3600

Product short

Memco Software, Inc. has announced Security for Open Systems. The security software intercepts sensitive system requests and includes secured single sign-on to all nodes so reusable passwords never travel on the network from Unix to the mainframe. Cost: $749. Memco Software, New York, N.Y. (212) 286-8820.



The New Watcom SQL 4.0. You Would Think We Looked at Your Wish List.

Introducing the database server you've been waiting for: **Watcom SQL 4.0.**

With powerful features like stored procedures, triggers and cascading updates and deletes, Watcom SQL 4.0 can enforce your business rules and ensure data integrity.

In addition, dynamic multiple database support gives you and your users the unique ability to add and remove databases on the fly.

And, take a look at our self-tuning query optimizer; it learns as you use it. Each query performed against your database teaches the optimizer about your data, making it smarter... and faster. This dramatically reduces the costs associated with set-up and performance optimization of your DBMS by expert personnel.

Also, the Watcom SQL product line includes both standalone and network servers built to allow you to move seamlessly between single and multi-user environments.

This is the database server with the functionality, performance and versatility you've been waiting for.

Don't let the price fool you!

To check out the new features of Watcom SQL 4.0, call 1-800-265-3525 today.

Watcom
A Powersoft Company

Watcom and the Lightning Device are trademarks of Watcom International Corporation. Other trademarks are the properties of their respective owners. Copyright 1994 Watcom International Corporation



BETWEEN 1519 AND 1522,
MADE HIS BID TO CIRCUMNAV
OPPRESSIVE CONDITIONS

REMIND YOU
APPLICATIONS ACROSS

FERDINAND MAGELLAN
IGATE THE GLOBE, FIGHTING
, MUTINY AND DESPAIR.

OF DEPLOYING
YOUR ORGANIZATION?

PROGRESS
SOFTWARE

Development and Beyond

Two Strategies for Client/Server Applications Development

Both in One Software...the SAS® System

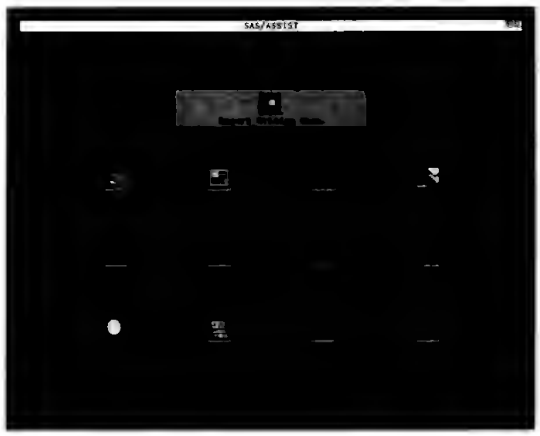
Only the world's leading information delivery system gives you two proven strategies for satisfying today's client/server applications development needs:

Empower Your User Community

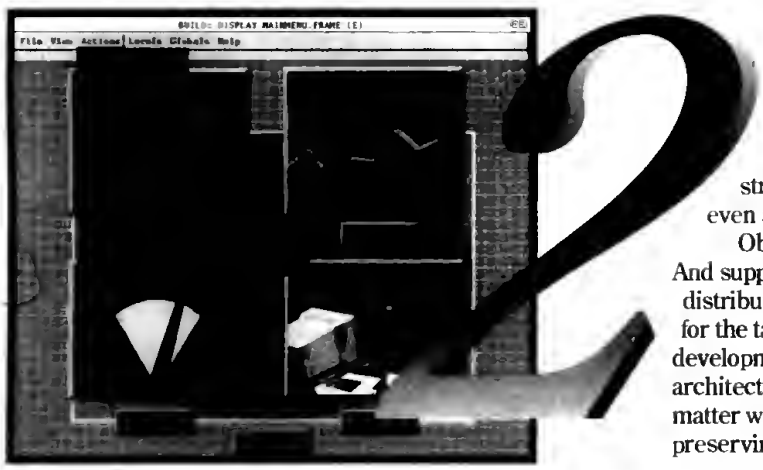
1

The SAS System offers a secure and manageable environment for making enterprise data available on demand. And for turning that data into useful business information for strategic decision making.

Through an intuitive, dynamic, and data-driven interface, even novice business users can handle the most sophisticated requests by themselves: ad hoc queries, reports, business graphs, forecasts, analyses, and more. By making the SAS System your standard for end user access and reporting, you'll empower users to satisfy their own information requests.



Empower Your Applications Developers



2

With more self-reliant end users, developers are free to concentrate on implementing client/server applications critical to your business. Here, too, the SAS System satisfies your most demanding requirements by supporting an *iterative* approach to rapid applications development. Put strategic business systems in production quickly... even as you continue to develop and enhance them.

Object-oriented tools simplify and speed development. And support for multiple client/server models (including distributing application logic to the processor best equipped for the task) provides a flexibility unrivaled by "client only" development tools. What's more, the SAS System's portable architecture means applications look and run the same no matter where you deploy them, desktop to data center, preserving your applications investment over the long haul.

Take a Minute Now to Take Years Off Your Development Cycles

With the SAS System, you'll improve business processes rather than just automating them. Users become more independent, developers more productive, and applications more valuable...today and tomorrow. For a closer look at the SAS System—and to find out how to receive these applications development tools for a free evaluation—just give us a call at **919-677-8200**.

SAS®

SAS Institute Inc.
Sales and Marketing Division
Phone 919-677-8200 ☐ Fax 919-677-8123
In Canada: Phone 1-800-363-8397

SAS is a registered trademark of SAS Institute Inc. Copyright © 1994 by SAS Institute Inc.

IS rethinks its goals for client/server

By Rosemary Cafasso

The reality of the less-than-spectacular cost savings with client/server technology is really sinking in.

In a recent survey of 305 information systems executives by the Business Research Group (BRG) in Newton, Mass., respondents said they now put business issues such as productivity and improved customer service ahead of cost savings as their key objectives in moving to client/server.

Other IS managers and users agreed.

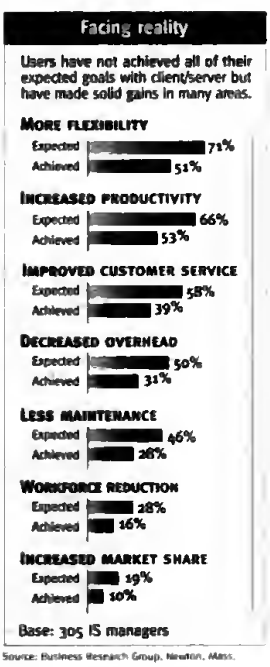
"Originally our focus was probably the money," said Gayle Best, assistant controller at Black & Veatch in Kansas City, Mo., which is installing Dun & Bradstreet Software's client/server decision-support application. "But flexibility and getting at data are very important to us."

Terry Thornton, director of financial systems at Vanstar Corp. in Pleasanton, Calif., said client/server had been sold on cost savings, but "the fact is it's the flexibility that gives you the most bang for the buck."

Hidden costs

Cheryl Ball, a program director at BRG, said early adopters of client/server technology zeroed in on differences such as basic hardware costs between big mainframes and server platforms.

"But the ongoing costs of client/server are much higher than anticipated," Ball added. "From our studies, people are saving money in the 20% range, but not in the 600% range like people first talked about."



Source: Business Research Group, Newton, Mass.

The BRG survey also showed that many companies are still struggling with reengineering issues as they migrate to client/server architectures.

For example, while about half of those surveyed said they are redesigning business processes and software development processes as they shift to the new technology, a full 47% of respondents are not.

Interviews with IS managers indicate there is still a variety of opinions on the reengineering topic.

Some companies are reluctant to make radical changes to any processes as they migrate to client/server, and they consider the

Goals, *page 116*

Group touts componentware

High-profile pilot projects boost modular applications approach

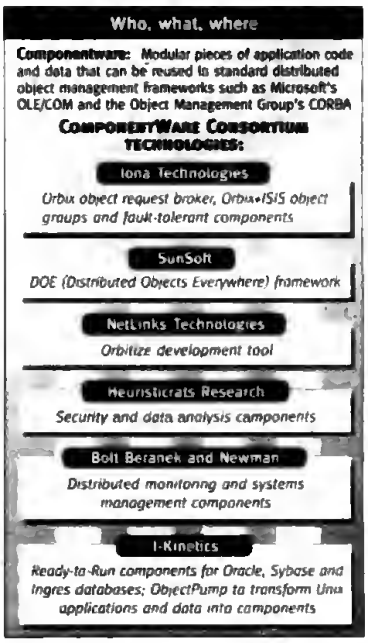
By Elizabeth Heichler

A new vendor consortium is out to prove that business applications can be built out of modular, reusable software components, and the effort has been enlisted by the U.S. Navy and engineering firm Pratt & Whitney for some pilot projects.

Companies teaming up for the ComponentWare Consortium (CWC) are Bolt Beranek and Newman, Inc., Heuristicrats Research, Inc., I-Kinetics, Inc., Iona Technologies Ltd., NetLinks Technologies, Inc. and SunSoft, Inc. Each is contributing its commercial technologies in distributed object management (see chart).

CWC also aims to submit technology to the Object Management Group (OMG) for possible incorporation into its standards, said Bruce Cottman, president of I-Kinetics in Burlington, Mass. Areas that the CWC will address in its standards work include common facilities as well as object services to provide reliability, fault tolerance, transaction handling and dynamic capabilities, among other possibilities.

The vendors are also integrating those technologies and working with developers at Pratt & Whitney and the Naval Sea Systems Command (Navsea) to implement component-based information systems.



Sinking resources

"Like everyone else in the [Defense Department], we've got major budget reductions, and we need to support our mission with fewer dollars and fewer people," said John Rivers, executive program manager for information systems at Navsea in Arlington, Va. Navsea's initial projects involving CWC are aimed at proving the concept viable.

Rivers said he hopes componentware eventually will deliver an innovative way of providing information services at a lower cost. "We need to look at the whole concept and how it can help us meet our mission requirements," he added.

The combination of reusable software components, data warehouses and packages to help tie components together should make things easier for systems programmers, Rivers said. While there are some Navsea developers with componentware experience, Rivers said it is a relatively new concept and that the organization will test the waters with two small projects before it moves on to three more complex ones. Navsea is also establishing a componentware learning center at its base in Keyport, Wash.

The ultimate goal at Navsea is to implement a system that integrates a wide range of Navsea applications including project management, computer-aided design and manufacturing, database management systems and desktop applications such as spreadsheets and word processors.

Navsea will focus on applications services and linking front-end Windows applications on the desktop to multiple databases, explained Gordon Wood, information technology program manager at the Keyport base. "We've been doing a lot of client/server since the mid-'80s, and we're now trying to blend that with our corporate data systems," he said.

Wood and Navsea applications developers will work with CWC members at the Keyport componentware learning center. He said he expects to use new tools that CWC vendors will create in the process. "We want to use as much off-the-shelf and reusable software as we can and do the minimum amount of code generation possible," Wood added.

At Pratt & Whitney in West Palm Beach, Fla., the goal is to build an "information factory" to support concurrent engineering for gas turbine engines and rocket propulsion engines, said Bruce Cottman, president of I-Kinetics, one of the vendors involved with the project. Pratt & Whitney spokesmen had no comment.

The information factory will assemble applications on demand from engineering product and process definition data components, Cottman explained. As a result, Pratt & Whitney hopes to have a set of reusable components and data standards for its engineering and manufacturing systems.

Some of those tools will be provided by NetLinks in Nashua, N.H., said Alan Ewald, NetLinks' chief technology officer. NetLinks' Orbitize tool kit provides facilities for browsing and building the OMG's Interface Definition Language, which is part of the Common Object Request Broker Architecture standard.

During the next two years, NetLinks will develop tools that create interface definitions by reverse-engineering from existing data sources, Ewald said. NetLinks will also develop software for automatically generating test modules, he said.

For its part, I-Kinetics is contributing its componentware technology, which Cottman characterizes as building blocks that unite Windows and Unix applications. Its I-Bridge ComponentWare enables Windows development tools and desktop applications to access Unix data sources and applications as if they were local Windows desktop applications, he said.

The I-Bridge ObjectPump transforms Unix data sources and Unix applications developed in-house into components, Cottman added.

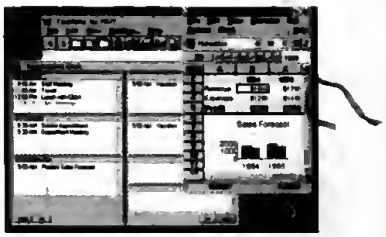

MAZDA'S I.S. CHIEF
CAN'T WAIT TO
GET WARPED.



OS/2 is in its third rev, so it's solid, stable, and mature.

Mike Anzis is the I.S. man behind the wheel of Mazda's computers. And OS/2® Warp is about to make his life easier.

From a basic 4MB laptop to a client/server system, the OS/2 family now scales an even wider variety of PC platforms.



The BonusPak gives mobile users the applications they need.

As Mike puts it: "We use OS/2 on our headquarters' client/server systems. It's also installed in our 900 dealerships. But until now, we haven't been able to get OS/2 everywhere we need it—on laptops in the field. OS/2 Warp changes all that." OS/2 Warp is the 32-bit, multitasking, Windows™-friendly way to run a computer. With simple installation and proven reliability, OS/2 Warp is a total computing solution that performs ruggedly at every level.

IT'S ONE MODEL THEY REALLY NEED ON THE ROAD.



A toolbar gets users into their applications quickly and easily.

And OS/2 Warp is a real communicator. With fax, Internet e-mail, and desktop conferencing, there isn't an easier way to keep those out on the road in the loop.

OS/2 Warp also offers Mike Anzis rock-solid reliability. "I know from years of experience with OS/2, I can trust it to keep performing. Now I can enjoy this peace of mind at every level."

OS/2 Warp is available for under $90. To get warped, stop by your local software dealer, or call 1 800 3 IBM-OS2. Ask for a free demo disk.

The new 32-bit, multitasking, multimedia, Internet-accessed, crash-protected, Windows-friendly, totally cool way to run your computer. **OS/2® WARP**

IBM®

OS/2 Warp is available from your software dealer. It's also available from IBM for $89 by calling 1 800 3 IBM-OS2.

Reseller prices may vary. OS/2 Warp consists of OS/2 version 3 and BonusPak. IBM, Operating System/2 and OS/2 are registered trademarks of the International Business Machines Corporation. Crash Protection and the OS/2 logo are trademarks of IBM. Windows is a trademark of Microsoft Corporation. ©1994 IBM Corp. All rights reserved.

Wizard turns English into database language

By Kim S. Nash

■ Ever try to speak SQL? No one should have to, even when communicating with corporate databases.

That is the impetus behind English Wizard, a query tool from Acton, Mass.-based Linguistic Technology Corp. designed to let end users query and gather information stored in databases using the plain old English language.

English Wizard is a desktop utility that sits atop PC applications such as single-user databases, spreadsheets and report writers. It translates English to various forms of SQL, the most common syntax for talking to relational databases.

"You don't have to know a lick of SQL, really, which means almost no training time for end users," said James Bradshaw, a director of database administration at Clemson University in Clemson, S.C. "You don't have to forget everything you always knew," he said.

The college has tested English Wizard for four months against an Oracle Corp. data warehousing database and a legacy Computer Associates international, Inc. CA-IDMS mainframe database. Two hundred to 300 users across Clemson's campus will use English Wizard to query and analyze information on student enrollment data, finances, purchasing and other topics, Bradshaw said.

English Wizard connects directly to Microsoft Corp.'s Access database and supports Open Database Connectivity for communicating with other relational and nonrelational databases. Object Linking and Embedding support is on the drawing board for later this year, said Larry Harris, founder and president of Linguistic Technology.

Harris' roots are in artificial intelligence. In 1975, he cofounded AICorp, which made a mainframe-based natural language product called Intellect. Most of English Wizard's 40 beta-test sites are also Intellect users.

English Wizard includes a data dictionary, a DOS file of English words and their meanings in different contexts. The product also translates complicated database functions such as "subselects" and "having" clauses.

Saves time

Albert Einstein Healthcare Foundation has tested the Access version of the product for the past few months and plans to roll it out to end users "as soon as possible," said John Mastronardo, information center manager at the foundation in Philadelphia.

Accounting clerks and medical personnel will be able to pull down mainframe patient and payroll data without requesting special reports from Einstein's information systems department, Mastronardo said. "We think it will be a time-saver for a lot of people," he added.

The product is available now at a cost of $99.

Bright future

PeopleSoft, Inc. plans to bundle English Wizard with its client/server financial applications, and Powersoft Corp. plans to embed the product into its development tools this year, according to Linguistic Technology founder Larry Harris.

Translation, please

A sample English-to-SQL translation for Microsoft's Access database

English

WHAT CUSTOMERS DIDN'T HAVE ANY ORDERS LAST MONTH?

SQL

```
SELECT [Customers].[Company Name],[Customers].[Contact Name]
FROM [Customers]
WHERE not Exists (SELECT [Ship Name] FROM [Orders] WHERE
   Month ([Order Date])=1 and Year([Order Date])=1995 and
   [Customers].[Customer ID]=[Orders].[Customer ID])
```

[redacted]

Mortice Kern Systems, Inc. has announced MKS Toolkit for Microsoft Corp.'s Windows NT 3.5.

According to the Waterloo, Ontario, company, MKS Toolkit for Windows NT 3.5 provides Unix system software utilities for the PC platform.

Tools include command editing and history, file processing and comparison and text manipulation and sorting.

MKS Toolkit for Windows NT 3.5 costs $299.

▶ *Mortice Kern Systems*
(519) 884-2251

CenterView Software, Inc. has announced Choreo for Microsoft Corp.'s Visual Basic, a client/server development tool set.

According to the San Francisco company, Choreo extends Visual Basic and features an object-oriented data access engine.

The DataDirector component is the SQL data access engine. The DataLink Manager is the user interface that lets users create data links connecting user-interface objects with database columns.

The DataLink Inspector provides an interface for setting complex database properties such as sorting, conditions and default values.

Choreo for Visual Basic costs $595.

▶ *CenterView Software*
(415) 873-1296

Far Systems, Inc. has announced The Far Voice 3.0, OS/2-based voice and fax application development software.

According to the Fort Atkinson, Wis., company, The Far Voice 3.0 is a platform for developing complex computer telephony and voice processing applications.

The product incorporates the Btrieve database engine and allows any program supported by Btrieve to be incorporated into other voice and fax applications.

Features of The Far Voice 3.0 include RS-232 links, terminal emulation, fax integration, remote maintenance and support for switch integration to private branch exchanges.

A developer's license costs $2,500 and includes four ports of voice runtime.

▶ *Far Systems*
(414) 563-2221

ObjectPlus Corp. has announced WinPlus 3.1, an object-based software development environment.

According to the Cambridge, Mass., company, WinPlus 3.1 features built-in support for Microsoft Corp.'s Visual Basic custom controls (VBX). WinPlus converts VBX controls into WinPlus user interface objects. The controls help accelerate graphical user interface (GUI) application development.

Developers can use WinPlus 3.1 to develop applications for computer-based training, process monitoring and control, presentations, GUI front ends for legacy systems, electronic books and database transaction processing.

WinPlus 3.1 costs $495.

▶ *ObjectPlus*
(617) 491-7575

Sterling Software, Inc. has announced Vision:Flashpoint 3.2, a tool for creating graphical user interfaces for existing applications.

According to the Atlanta company, Vision:Flashpoint 3.2 lets users integrate host, LAN and workstation applications into a single user-oriented desktop.

The product provides easier access to editors and other design and development tools and provides communication drivers that eliminate the need to maintain separate versions of a program for connectivity purposes.

Users can save any panel as a template for reuse on other screens, preserving the links and properties of panels and controls.

Vision:Flashpoint 3.2 costs $9,500.

▶ *Sterling Software*
(404) 551-8300

InSync Software Corp. has integrated its Passport development environment with TechGnosis International, Inc.'s SequeLink multiplatform database middleware.

According to the Ronkonkoma, N.Y., company, the integration of Passport and SequeLink lets developers build distributed applications that can access heterogeneous databases without having to purchase network products for each database.

Passport's abstract database layer interfaces with SequeLink, and the two products work together behind the scenes of the development process.

SequeLink costs $220 per client for InSync customers.

▶ *InSync Software*
(516) 981-3000

Product short

Revelation Technologies, Inc. has introduced OpenInsight for Workgroups:Lotus Notes Edition, a repository-based development environment. The product lets Notes users develop, manage and maintain groupware applications. Cost: $1,995 per developer. Revelation Technologies, Stamford, Conn. (203) 973-1000.

Goals

CONTINUED FROM PAGE 113

new technology to be enough for their users to manage.

For example, Terry Tung, director of IS at Morrison-Knudsen Corp. in Cleveland, said his company adapted business practices to fit the client/server financial software it installed from Platinum Software Corp. This called for "minimal change," which did not disrupt users, he added.

An evolution

John Collins, chief information officer at Plaza Home Mortgage Corp. in Santa Ana, Calif., said his staff redesigned the development process to fit a client/server methodology, including more graphical and event-based programming, and is now using tools such as PowerBuilder from Powersoft Corp. in Concord, Mass.

"We aren't redefining [the software development process] now," Collins said. "It's an evolving process."

Ball said there is an expected lag time with some user companies that may be unwilling to tackle radical changes on all fronts, from development to systems to business processes.

"They do have to adopt new methods to develop software," Ball said. "Moving from procedural [programming] to objects requires re-engineering. [But] there are still IS shops who are very resistent to change."

INSIDE:
MassNet launch targets Massachusetts technology networks. **See page 122**

LIFE in the FOREIGN LANE

By Alice LaPiante



IT'S TIME AGAIN for Ken Hamilton's monthly sit-down with his information systems peers at Barclays Bank PLC.

Off he goes, briefcase in hand, down the hall and into the elevator. Once out the door, he fights through tangled New York traffic to Kennedy International Airport, where he boards a plane for the more than six-hour flight to London's Heathrow Airport. After getting through red tape in customs, he hails a cab that threads its way through crowded London streets to Barclays' headqnarters. Voila — he's arrived.

Finally, a jet-lagged Hamilton — who is, in effect, the chief information officer of Barclays' North American operations — joins other senior Barclays IS managers from 75 countries around the globe for their monthly meeting of the minds.

"We've found that physically being in the same room on a regular basis is absolutely essential for keeping our worldwide IS groups running smoothly," Hamilton says.

Essential, indeed. More and more organizations are peddling their services and wares in the global village. This crossing of temporal, geographic and legal boundaries poses increasingly complex challenges for U.S.-based IS managers. Even the most seasoned IS managers will find themselves put to the test by linguistic and cultural differences with their foreign counterparts, uneven availability of hardware and software products and spotty vendor support services.

And American IS executives — such as Hamilton — who happen to work for foreign-based multinationals face a plethora of other issues as well, including the following:

- They are culturally and geographically removed from the epicenter of key business decisions.
- They often find overseas chief executive officers are more reluctant than American CEOs to adopt new or emerging technologies.
- They frequently find themselves forced into global IS standards and purchasing contracts that do not suit local operating needs.

Foreign lane, *page 120*



American IS managers working for foreign multinational corporations face challenges that go beyond linguistic and cultural differences



NICK KELSH

Bob Rubin, vice president of information services at Elf Atochem ETO, says that due to language barriers, international E-mail can exacerbate cultural differences

THE

PERFORMANCE

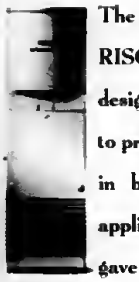
OF RISC AND

WINDOWS NT.

WITHOUT

THE RISK.





The NEC Express RISCserver™ was designed expressly to protect your data in business-critical applications. We gave it internal RAID, UPS, an integrated service modem, and ECC memory—all of which ensure superior dependability. But equally as important is the MIPS RISC architecture itself—the same platform Microsoft used to design Windows NT.™ Add to that the scalability of NEC's MultiRISC™ architecture and NEC's three-year limited on-site warranty, and you have some powerful reasons to consider the Express RISCserver. For more information, call 1-800-709-3434. After all, why risk your valuable information with anything less?

Express RISCserver, MultiRISC and See, Hear and Feel the Difference are trademarks of NEC Technologies, Inc. All other trademarks and registered trademarks are the property of their respective owners. For information via FastFacts™ call 1-800-366-0476 and request doc # 97774721 © 1995 NEC Technologies, Inc. NEC GSA#GS00K94AG85241

SEE, HEAR

AND FEEL THE

DIFFERENCE.™

NEC

FOREIGN LANE

CONTINUED FROM PAGE 117

They must adapt to social and cultural mores that are dramatically different from those in the U.S.

"The American decision-making process tends to be very direct — maybe to the point of being aggressive or confrontational," says Evan Wride, director of information services at Nissan Motor Corp., a U.S. subsidiary of Japanese automotive manufacturer Nissan Motor Ltd. European and Asian corporate cultures will probably require a different approach, he says.

"In Japan, for example, they tend to want to build relationships and consensus over time, so things can take a little longer or feel as though they are moving more slowly," Wride says. While this may be frustrating for a U.S.-based CIO, Wride says, "It may also result in better long-term results since things are thought through more carefully."

Today, things are considerably smoother than they were even three years ago [CW, April 12, 1992]. Smoother vendor distribution and support networks and more comprehensive international telecommunications services have made crossing the ocean a less hazardous technological undertaking. But a number of unique challenges still confront the domestic IS manager whose CEO resides overseas.

The biggest challenge by far, U.S.-based managers say, is making sure that being removed from world headquarters by seven or eight time zones doesn't mean being left out when all-important IS global architectures and policies are formulated. Being out of the loop can be frustrating in a decentralized domestic organization, but it's far harder to remedy when the home base is located in another country rather than another state.

"Being CIO of an American entity, even a multinational one, is completely different," says Hamilton, who formerly worked for a U.S. bank. It can be a hit of a jolt moving from a leadership to an "advisory" role, he says.

"If you're the CIO at corporate headquarters, you're pretty much in charge. You're in the home office. You have access to the top business managers. You define the strategy, the architecture, the technological direction the corporation will take. Ultimately, you have the final word. That simply isn't the case when the headquarters is overseas," Hamilton says.

At Nissan, Wride had to learn quickly that when a Japanese counterpart said "yes" or nodded, he wasn't "necessarily agreeing with me," he says. "In Japan, a 'yes' means, 'I heard you.' Nothing more."

For this reason, Wride makes sure he gets everything in writing when working with an overseas superior or colleague. Currently developing a new warranty claims system for his U.S.-based operation, Wride is in frequent contact with Japan to ensure his system will coexist peacefully with the warranty system at the home office.

"We always make sure we are absolutely clear on what actions are being taken or not being taken," he says. Generally, this means firing off an electronic-mail message or better yet, a fax of a formal memo containing a signature.

"For some reason, receiving a personally signed document makes a big difference in Japan," he says.



"The American decision-making process tends to be very direct — maybe to the point of being aggressive or confrontational."

— Evan Wride, director of information services, Nissan Motor Corp.

Mail problems

At Elf Atochem ETO, the Philadelphia-based subsidiary of the Paris-based pharmaceuticals giant, Bob Rubin, vice president of information services for Elf's North American operations, is not a fan of international E-mail, primarily because of language and cultural barriers.

"We find that 'delayed' communications such as E-mail don't work terribly well," he says. The dangers of hastily fired off E-mail messages are well known within domestic organizations. There is always the danger of forgetting or ignoring social niceties because of the impersonal nature of the medium. E-mail can also unintentionally offend the receiver because of the lack of accompanying visual clues indicating the sender's tone or attempts at humor. Language and cultural differences can dramatically exaggerate these problems.

If it's impossible to arrange a face-to-face or telephone meeting, Rubin says, "we prefer to use faxes. They tend to be more thought-out, more formally written and contain less imprecise language."

Hamilton makes sure he stays in close personal touch by his monthly visits to London. These trips are especially important because the monthly consortium of Barclays CIOs has no authority to set worldwide standards. That responsibility falls to a dedicated London-based architectural standards team that issues guidelines for Hamilton and his peers to follow. The monthly trek is thus a preemptive strike by Hamilton and the other scattered Barclays CIOs to make sure their in-the-trenches needs will not be put out of mind simply because they are out of sight.

Balancing act

Then there's the need to balance the benefits of setting worldwide standards with maintaining the right amount of local autonomy. Just ask Rick Carney.

As director of information services at ABB Power Generation, Inc., a North Brunswick, N.J.-based subsidiary of Asea Brown Booveri, the Swedish/Swiss engineering conglomerate, Carney has a lot of leeway for doing his own technological thing. Each ABB company around the world has its own board of directors, president and CIO. All these executives enjoy a good deal of autonomy from the home office in Switzerland. Despite this, many ABB companies have found it useful to share data with formerly separate subsidiaries.

"We discovered certain business synergies that made it helpful to swap customer proposals, product specifications, engineering drawings and even financial spreadsheets," Carney says of this trend.

"If you're the CIO at corporate headquarters, you're pretty much in charge. You're in the home office. You have access to the top business managers. You define the strategy, the architecture, the technological direction the corporation will take. Ultimately, you have the final word. That simply isn't the case when the headquarters is overseas."

— Ken Hamilton, CIO of North American operations, Barclays Bank PLC

Software and data compatibility at the desktop level was therefore fast becoming an attractive proposition. Four years ago, ABB world headquarters made a suggestion to its various subsidiaries: Create an informal and completely voluntary IS standards team to facilitate data sharing among ABB companies.

"A lot of people questioned whether this was a good idea," Carney remembers. For starters, there was the expense of sending the top technologist to an overseas meeting for three to four days at a time, several times a year. Then there was the worry about whether this would mean giving up valued independence.

But in retrospect, "there's no doubt it was a smart thing to do. We remain decentralized, operationally, but we've taken advantage of some opportunities to get some economies of scale," Carney says.

The ABB IS core team now meets three times a year to set general IS guidelines and directions for ABB companies. Microsoft Corp.'s Office has been identified as the standard desktop office software suite; Lotus Development Corp.'s Notes has been tagged for worldwide development of E-mail and groupware applica-

Culture Clashes

American IS executives who work for foreign-based multinationals must deal with a more complex mix of international IS challenges than their counterparts who work for U.S. firms. Among these issues are the following:

- Taking a backseat role when future technological directions are determined for the corporation as a whole.
- Having limited access to the senior business executives who drive the global business, which in turn limits participation in strategic corporate decisions and may hinder career growth.
- Dealing with worldwide vendor licenses that limit the ability to take advantage of domestic discounts or promotions in product pricing and services.
- Overcoming a let's-take-it-a-little-slower attitude toward new technology that is more prevalent overseas than in the U.S.
- Facing cultural differences that can cause communications problems even when English is the common language.

Take a slice off the price of COMPUTERWORLD.



51 issues for only $48. *Now Only $39.95*

Yes, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $39.95* per year - a savings of $8.00 off the basic subscription price. Plus, I'll also receive the '94-'95 COMPUTERWORLD Salary Survey FREE just for trying COMPUTERWORLD. P/Code 98

First Name _____ MI _____ Last Name _____

Title _____ Company _____

Address _____ City _____ State _____ Zip _____

Address Shown ❑ Home ❑ Business ❑ New ❑ Renew Basic Rate $48

* U.S. Only. Canada $95. Mexico, Central/South America $150. Europe $295, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the questions below to qualify for this special rate.

1. BUSINESS/INDUSTRY (Circle one)
10 Manufacturer (other than computer)
20 Finance/Insurance/Real Estate
30 Medical/Law/Education
40 Wholesale/Retail/Trade
50 Business Service (except DP)
60 Government - State/Federal/Local
65 Communications Systems/Public Utilities/ Transportation
70 Mining/Construction/Petroleum/Refining/Agric
80 Manufacturer of Computers, Computer-Related Systems or Peripherals
85 Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90 Computer/Peripheral Dealer/Dist./ Retailer
95 Other _____ (Please Specify)

2. TITLE/FUNCTION (Circle one)
IS/MIS/DP MANAGEMENT
19 Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21 Dir./Mgr. MIS Services, Information Center
22 Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr. /PC Mgr., Tech Planning, Admin. Services
23 Dir./Mgr. Sys. Development, Sys. Architecture
31 Programming Management, Software Developers
41 Engineering/ Scientific R&D Tech. Management
60 Sys. Integrators/VARs/Consulting Management
CORPORATE MANAGEMENT
11 President, Owner/Partner, General Manager
12 Vice President, Asst. VP
13 Treasurer, Controller, Financial Officer
DEPARTMENTAL MANAGEMENT
51 Sales & Mktg. Management
70 Medical, Legal, Accounting Management
OTHER PROFESSIONAL MANAGEMENT
80 Information Centers/Libraries, Educators, Journalists, Students
90 Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase (Circle all that apply)

Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

App. Development Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No

E4B5-9

Take a slice off the price of COMPUTERWORLD.

51 issues for only $48. *Now Only $39.95*

Yes, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $39.95* per year - a savings of $8.00 off the basic subscription price. Plus, I'll also receive the '94-'95 COMPUTERWORLD Salary Survey FREE just for trying COMPUTERWORLD. P/Code 95

First Name _____ MI _____ Last Name _____

Title _____ Company _____

Address _____ City _____ State _____ Zip _____

Address Shown ❑ Home ❑ Business ❑ New ❑ Renew Basic Rate $48

* U.S. Only. Canada $95. Mexico, Central/South America $150. Europe $295, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the questions below to qualify for this special rate.

1. BUSINESS/INDUSTRY (Circle one)
10 Manufacturer (other than computer)
20 Finance/Insurance/Real Estate
30 Medical/Law/Education
40 Wholesale/Retail/Trade
50 Business Service (except DP)
60 Government - State/Federal/Local
65 Communications Systems/Public Utilities/ Transportation
70 Mining/Construction/Petroleum/Refining/Agric
80 Manufacturer of Computers, Computer-Related Systems or Peripherals
85 Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90 Computer/Peripheral Dealer/Dist./ Retailer
95 Other _____ (Please Specify)

2. TITLE/FUNCTION (Circle one)
IS/MIS/DP MANAGEMENT
19 Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21 Dir./Mgr. MIS Services, Information Center
22 Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr. /PC Mgr., Tech Planning, Admin. Services
23 Dir./Mgr. Sys. Development, Sys. Architecture
31 Programming Management, Software Developers
41 Engineering, Scientific R&D Tech. Management
60 Sys. Integrators/VARs/Consulting Management
CORPORATE MANAGEMENT
11 President, Owner/Partner, General Manager
12 Vice President, Asst. VP
13 Treasurer, Controller, Financial Officer
DEPARTMENTAL MANAGEMENT
51 Sales & Mktg. Management
70 Medical, Legal, Accounting Management
OTHER PROFESSIONAL MANAGEMENT
80 Information Centers/Libraries, Educators, Journalists, Students
90 Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase (Circle all that apply)

Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

App. Development Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No

E4B5-5

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD
P O BOX 2044
MARION OHIO 43306-4144

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD
P O BOX 2044
MARION OHIO 43306-4144

tions. It's important to note, however, that adherence to these standards is voluntary. No central ABB group has the power to enforce them. Indeed, no such group exists.

Carney likes it that way. "It's important that the people actually implementing the technology are the ones who make the final decisions," he says. "I need to be able to do what's best for my business."

The downside of the ABB approach. The group has no formal decision-making or enforcement powers, and "sometimes we have trouble agreeing," Carney says. So this peer group tends to set a minimal number of general software directions rather than hardware- or vendor-specific standards.

Global licensing

Making sure that the global product standards being formulated tens of thousands of miles away are in line with U.S. requirements is one issue. Successfully negotiating with vendors to acquire those products at a reasonable cost and in a reasonable time frame is another matter.

There are two challenges: If individual CIOs in individual operating divisions or countries are free to acquire products on their own, the U.S. CIO loses the potential for volume discounts that a centralized purchasing department wields. On the other hand, a centrally fulfilled global license or buying agreement — particularly if negotiated overseas where hardware and software prices can still carry a significant premium — may prevent a U.S.-based IS manager from taking advantage of particularly good prices or promotions not available overseas.



"In general, Europeans haven't had the experience we've had supporting PC applications, and they don't yet understand the necessity for keeping your users in sync." The European perspective tends to be, why upgrade when the old version is working just fine? "But you can't have half the company on Microsoft Word 6.0 and half on Word for Windows 2.0. Not if your goal is the seamless exchange of documents."

— Rick Carney, director of information services, ABB Power Generation, Inc.

At Elf Atochem, each CIO has the authority to negotiate with vendors for the best deal for their operation. They also carefully research the needs of other Elf subsidiaries around the globe and write a licensing agreement that allows for worldwide access to the terms — but without locking other Elf companies into those terms.

"When you're dealing with a global operation, you need to make sure your licensing agreements don't preclude local facilities from getting a better deal if they possibly can," Ruhin stresses. "There are often quite valid reasons why a vendor can provide better opportunities or lower prices to certain geographic areas. You need to be flexible enough in order to take advantage of those times."

A former point of contention for multinational CIOs seems to be easing, at least among major technology vendors. Software and hardware have traditionally cost substantially more overseas — up to twice as much as in the U.S. In the UK, for example, for most hardware and software, you simply substituted the dollar sign with a pound sign, a 50% to 60% increase over U.S. prices, Hamilton says.

That has eased, primarily due to the clamor raised by major multinational customers. Today, Microsoft in Redmond, Wash., WordPerfect, the Novell, Inc. Applications Group in Orem, Utah, and Lotus in Cambridge, Mass., among others, have designed new purchasing programs that take the needs of multinationals into account.

U.S.-based CIOs also often find themselves ahead of their overseas colleagues in their desire to adopt emerging technologies. As a result, "foreign firms tend to be less likely to jump on newer technologies, which can lead to frustration for their U.S.-based executives," says David King, CIO at Korn Ferry, an international recruiting firm in Los Angeles.

Either that or they tend to lead by example. At Nissan, the domestic IS team has long taken the global lead when it comes to telecommunications.

"Our group has been coordinating network issues for a long, long time," Wride says. Now the same is becoming true of client/server development. Nissan has a number of key distribution applications under development and is using IBM RS/6000 servers and Windows clients over Banyan Systems, Inc. LANs for legal, decision-support and human resources applications.

"We're beginning to field a lot of questions from Europe and Japan, who want advice about desktop hardware, software and LAN operating systems as they begin to move away from the mainframe," he says.

At ABB, Carney's group has developed a number of Notes applications that have been replicated around the world. One such application: a manufacturing defect Notes database if an ABB employee in the U.S. finds a foreign-made part that doesn't conform to specifications, simply logging that fact in a Notes database will result in immediate notification of all interested ABB employees worldwide. This allows the affected ABB overseas manufacturing plant to embark on an immediate explanation or correction.

"We do a lot more leading-edge things here than in the UK," Hamilton agrees. "But, at least for us, there is a good-news, bad-news aspect to that."

Because Barclays' overseas offices were further behind in implementing PCs and LANs, they were able to leapfrog to a state-of-the-art client/server-based branch management system based on Unix and open systems throughout its worldwide operations, a move that probably wouldn't have been economically or technically possible if they had invested heavily in Intel Corp. PCs.

Technology bridges culture gap

Still, store-and-forward technologies such as voice mail and E-mail are increasingly valuable weapons when battling the time zone and geographic distance challenges faced by U.S.-based IS managers and employees.

For this reason, Carney found one communications strategy absolutely essential: providing a single toll-free number so his employees can access his network from anywhere in the world. Although ABB has limited T1 lines installed between various U.S. operating companies, in general Carney depends on dial-up access. This means making it as easy as possible for on-the-road ABB workers — whether across town, across the country or across the world. True, he says, paying for worldwide toll-free access will ultimately cost more than if employees dialed in to the network using toll calls. But Carney feels his firm would suffer from a lack of communication and coordination without the ease of use provided by the toll-free access.

Yet despite rosy predictions that technologies such as E-mail, groupware and interactive videoconferencing will replace traditional face-to-face communication — a major expense and hassle when working for a foreign boss — U.S.-based CIOs flatly say this simply isn't the case.

"Because of the cultural differences, you absolutely cannot replace the traveling, no matter how sophisticated your E-mail or videoconferencing network happens to be," says Bruce Hawthorne, president of Hawthorne Associates, Inc., a Peapack, N.J.-based international IS consulting firm.

A case in point: Elf Atochem installed videoconferencing systems at its offices around the world with the idea of cutting down on worldwide travel. However, travel has remained fairly constant. But now it is supplemented with ever-greater frequency by "virtual" meetings, Ruhin says. This enables Elf employees to work together much more closely.

The real-time aspect of videoconferencing means you can ask questions and get immediate answers when a language or cultural miscommunication arises, he says. Also, you get the visual clues missing from a telephone conversation or faxed memos.

Of course, this would also be the case if trying to collaborate with a domestic colleague who happens to be located in another state, he says. "But the fact that you are part of an international company increases the complexity because of the range of possible differences — cultural, linguistic, political," Ruhin says. But Ruhin echoes his fellow CIOs when he says this can enhance, not detract from, job satisfaction.

"I find myself using a greater range of interpersonal and management skills than I would otherwise need," he says. Carney agrees. "The same things that make it challenging make it quite exciting," he says. ■

LaPlante is a freelance writer in Woodside, Calif.

Building Better Bridges

American-based IS executives can take steps to ease the difficulty of conducting business with their foreign-based peers

- Hold regular face-to-face meetings.
- Get overseas decisions in writing.
- Use faxes rather than E-mail.
- Create an informal IS standards team.
- Have flexible licensing agreements.
- Provide a worldwide toll-free network access number.

MIRACLE REWORKERS?

MassNet, Massachusetts' newly launched collaborative network, has high aspirations, but can it bring the Massachusetts miracle back?

By David Weldon

In an attempt to play catch-up with Silicon Valley in California, business and community leaders in Massachusetts have launched a collaborative for sharing innovative ideas and information via a statewide electronic network.

But many business executives attending the official launch of MassNet: Collaboration for the Commonwealth may be wondering what's in it for them because early talk has focused more on what they can do for the community than on what collaboration can do for them.

MassNet sponsors have identified several areas in which they hope MassNet can benefit local public schools, the arts, and cultural and social service agencies, all with the financial backing and technology help of local businesses. But proposals on how MassNet could benefit the business community so far lack specifics that could be key to lining up support.

"If companies are going to support these projects, they're going to have to be shown what they'll get out of it. There is a selfish side to this," says Shula Malkin, a consultant at CSC Index, Inc. in Cambridge, Mass.

Sponsors say they hope to establish a collaborative computer network through which local businesses can share information. How this network would be created or implemented did not come up at the meeting.

MassNet debuted on Jan. 23 at a day-long event at The Computer Museum in Boston, with more than 100 business managers, social service agency representatives and educators, as well as state and federal government officials, in attendance.

The effort is modeled after the Joint Venture collaboration created in 1992 to promote economic vitality and the quality of life in Silicon Valley. Specifically, it aims to duplicate the efforts of the Smart Valley project, one of 13 initiatives created in the Joint Venture collaboration. Smart Valley was established almost as an afterthought to provide the information infrastructure necessary to support the other 12 initiatives, each of which targets a specific area such as health care, education, commerce or government.

MassNet intends to do the same for the Greater Boston region. The purpose of the initial MassNet meeting was "to bring together people, collaborations and technologies in order to assess common needs and opportunities," says Jessica Lipnack, one of the hosts of the event.

First things first

But the program seems much like a case of putting the cart before the horse. MassNet is an early collaborative effort and does not have the array of other projects in place that Silicon Valley has. These projects include HealthNet, which promotes information sharing in the health care industry, and CommerceNet, which bolsters the electronic commerce sector, among others.

The Joint Venture also has strong state support, something that some fear MassNet lacks. Several attendees at the launch noted the absence of Gov. William Weld and Boston Mayor Thomas Menino, leading a few to question government support. U.S. Rep. Edward Markey (D-Mass.), former chairman of the House of Representatives' Telecommunications Subcommittee, did attend.

For many attendees, the event was the first exposure to MassNet's goals. Several said the gathering was more beneficial for personal networking than for the project ideas tossed about.

Richard Dale, vice president of information systems at MicroTouch in Methuen, Mass., says he agrees with the long-term goals of MassNet and wants "to stay tuned in" to its development. But he echoed the feelings of many in attendance in saying his initial interest is little more than curiosity.

Dale says he hopes to satisfy that curiosity at the end of the spring, when MassNet sponsors plan to have their organizational structure in place and begin work on their first projects. ■

Weldon is *Computerworld*'s associate editor, management.

FORGING AHEAD

MassNet's interim timetable for organization-building and project initiation:

JANUARY 1995	• MassNet formation process begun • Initial projects identified
MAY 1995	• Nonprofit MassNet organization established • Launch first three projects
OCTOBER 1995	• MassNet governance and systems established • Launch new projects
MAY 1996	• Project status review
OCTOBER 1996	• Launch new projects

BUSINESS BOOSTERS

Initial participants in the MassNet collaborative have identified 21 target areas for the project. Among the business goals are:

- Establishing a job opportunities data bank
- Aiding small business development
- Promoting the region as a business center
- Commercializing innovation
- Improving business marketing opportunities
- Establishing a technology park
- Improving information access in health care
- Aiding new technology applications
- Connecting local databases

Intelligence Files

Leadership diverges

What does technology have to do with exercising leadership? Very little, say many managers.

That is the finding of a survey of 1,450 senior and midlevel managers and executives at 12 global organizations by Gemini Consulting in Morristown, N.J. The survey, "Champions of Change: A Global Report on Business Transformation," looked at the link between leadership capabilities and organizational effectiveness.

"It concerns me that so few business leaders are exploring new technologies to help them with leadership challenges," Francis J. Gouillat, Gemini Consulting senior vice president, said of the findings. "New technologies can be utilized to leverage communications of strategic objectives and create ways to better manage the learning processes in their organizations."

Participants were asked to identify the most important leadership capabilities from a list of 45, and the desire to explore new technologies was not ranked as a high priority.

Topping the list were articulating a tangible vision, value and strategy (32%); empowering others to do their best (27%); being a catalyst/manager of strategic change (26.7%); getting results/managing strategy to action (25%); and exhibiting a strong customer orientation (24%).

Tough on turnover

Staff turnover among data processing professionals rose to double digits last year, and many companies are looking at new ways to compensate their data processing staffs to hold on to them.

That is the finding of a new survey of 63 Fortune 500 corporations by Edward Perlin Associates, Inc., a New York compensation management consultancy. The survey reports that this turnover trend is expected to continue this year, and many companies are upgrading salaries and other compensation methods for lower grades and positions as a result.

The survey suggests this turnover trend "bodes ill for companies that haven't maintained competitive compensation levels during the last several years," said John Warlikowski, a consultant at Edward Perlin. "Some of these compensation laggards will have to go through the long and costly process of replacing key personnel if they don't act aggressively to retain their staffs."

Leave home without it

American Express Co. wants to make sure you don't leave home without it, whether you're actually carrying the card or not. Two weeks ago the company set up shop on the Internet with ExpressNet.

According to the *Dallas Morning News*, the on-line service offers cardholders a variety of information bulletin boards such as travel and consumer tips, communication access to the company and 24-hour access to individual accounts.

Cardholders can now check their account balances and whether charges and payments have been posted. Through checkbook programs such as Quicken and Managing Your Money, cardholders can also make electronic payments to their accounts.

The service also allows noncardholders to apply on-line for a card.

To take advantage of the service, cardholders must enroll by filling out an electronic form about their card and account information. They then receive a password in the mail that allows them access to ExpressNet services and their accounts.

Calendar

MARCH 12-18

15th Annual Use of Clinical Information Systems Conference. Snowbird, Utah, March 12-15 — Contact: Association for Applied Clinical Information Systems, Ann Arbor, Mich. (313) 971-6557.

Uniforum '95. Dallas, March 12-16 — Keynote speakers include Ed McCracken, chief executive officer, Silicon Graphics, Inc., Robert Frankenberg, CEO, Novell, Inc., and Bruce Tognazzini, engineer, SunSoft, Inc. Contact: The Interface Group, Needham, Mass. (617) 449-6600.

Managing the Information Resource: Information Technology and the New Value Equation. Los Angeles, March 12-17 — Forum focuses on frameworks, techniques and skills necessary to align information technology with the needs of business. Contact: Marcie Desmond, Cambridge Technology Partner, Cambridge, Mass. (617) 374-8702.

13th Annual National Conference on Ada Technology. Valley Forge, Pa., March 13-16 — Contact: Rosenberg & Risinger, Culver City, Calif. (310) 397-6338.

Toward an Electronic Patient Record '95. Orlando, Fla., March 14-19 — Eleventh international symposium on the creation of electronic health record systems and global conference on patient cards. Keynote presentations include "Cutting the Hype: Real Life Demonstrations of Today's Capabilities" and "Focus on the Patient: Effects of Changing Technology on the Patient." Contact: Medical Records Institute, Newton, Mass. (617) 964-3923.

MARCH 19-25

Life Office Management Association Systems Forum and Exhibit 1995. Orlando, Fla., March 19-22 — Life insurance industry conference features more than 800 management and technical sessions in areas such as data security, client/server and LANs. Contact: Guide International, Chicago, Ill. (312) 245-1599.

National Fiduciary and Securities Operations Conference. Orlando, Fla., March 19-22 — Features 30 concurrent sessions divided into five categories: management, securities, products and services, technology and global custody. Contact: American Bankers Association, Washington, D.C. (202) 663-5000.

Object World. Boston, March 19-23 — Contact: IDG World Expo, Framingham, Mass. (508) 879-6700.

FOSE '95: America's Integrated Information Technology Exposition. Washington, March 20-23 — Contact: Reed Exhibition Cos., Silver Spring, Md. (800) 791-3673.

PCB Design Conference. Santa Clara, Calif., March 20-24 — Focus on emerging technologies used to design and manufacture printed circuit boards. Contact: Yolanda White, Miller Freeman, Inc., San Francisco, Calif. (415) 905-2354.

The Business Side of Software and Technology Licensing. Atlanta, March 23-24. The conference will also be held April 20-21 in Chicago and June 8-9 in Washington — Fee is $1,375, and member discount price is $1,195. Contact: American Management Association, Saranac Lake, N.Y. (800) 262-9699.

MARCH 26-APRIL 1

The 6th Annual Commercial Lending Executive Conference. Irving, Texas, March 26-28 — Theme: "Banking on Change: Tomorrow's Bank, Today's Leaders." Contact: BancA/Andersen Consulting, Dallas, Texas (214) 761-8127.

National Automated Clearing House Association 1995: Electronic Payments, Business Solutions. New Orleans, March 26-29 — Conference focuses on radical changes in the way corporations, consumers, governments and financial institutions exchange information and payments. Contact: National Automated Clearing House Association, Herndon, Va. (703) 742-9190.

The Natural Conference. Boston, March 26-29 — Conference focuses on topics of interest to users and encompasses areas of systems development that may or may not relate to Software AG products. Areas of interest will include event-driven programming, graphical user interface design, object-oriented programming and design and programming techniques in the client/server environment. Contact: Jim Wisdom, The Natural Conference Committee, Boston, Mass. (617) 342-3660.

Financial Executives Institute's Information Management Issues Conference. San Jose, Calif., March 27-28 — Contact: Laura Zepp, Financial Executives Institute, Morristown, N.J. (201) 898-4629.

Network/Interop '95. Las Vegas, March 27-31 — The session topics include enterprise applications, networking management, practical LANs, network connectivity, practical Internet and switched networks. Admission is free. Contact: Softbank Expos Conference Co., Foster City, Calif. (800) 488-2883.

Automated Manufacturing Exhibition and Conference. Greenville, S.C., March 28-30 — Contact: South Carolina State Board for Technical and Comprehensive Education, Columbia, S.C. (803) 737-9355.

Advanced Manufacturing Technology Conference. Cleveland, March 29 — Sponsored by Advanced Manufacturing Research, Inc., Boston, Mass. (617) 542-6600.

APRIL 2-8

Seventh Annual National Managed Health Care Congress. Washington, April 2-5 — Contact: National Managed Health Care Congress, Burlington, Mass. (617) 270-6000.

The 12th Annual Conference and Exposition of the Information Systems Security Association (ISSA). Toronto, April 2-5 — Conference theme, "Learning From Each Other," will be conveyed in educational topics such as security awareness; client/server/distributed computing security; telecommunications/network security; vendor security solutions, and lessons. Keynote speakers include: Terry F. Lenzner, chairman of the Investigative Group, Inc. in Washington. Contact: Lona Kovacs, ISSA International headquarters, Glenview, Ill. (708) 699-6441.

Application Development Conference & Exposition. New York, April 3-6 — Topics include "Enterprise Client/Server Development," "Building Enterprise Reliable Systems," "Object-oriented Strategies and Enterprise Development," "Project Championship," "Enterprise Application Architectures," "Transitioning Legacy Systems to Client/Server" and "The Year 2000 Problem and Solutions." Contact: Software Productivity Group, Northboro, Mass. (508) 393-7100.

Data Warehouse & Decision Support Systems '95. Rockville, Md., Arlington, Va., April 3-6 — Sponsored by Barnett Data Systems. Fees: one or two attendees — $1,295 per person; three to nine attendees — $1,000; 10 or more — $800. Exposition costs $25 per person. Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

Introduction to Globally Scalable Parallel Computing. Ithaca, N.Y., April 4 — Contact: Cornell University's Engineering and Theory Center, Ithaca, N.Y. (607) 254-8686.

Application Development Conference & Exposition. New York, April 4-5 — Fees: four-day all-inclusive package — advanced registration (expires Feb. 28) $950; three-day full conference and exposition package — $750; one-day attendance — $300. Contact: CMP Applications, Inc., New York, N.Y. (516) 733-6770.

"From Form to Function Symposium." Edison, N.J., April 6 — This symposium will cover "Electronic Forms Design and Solutions," "Paper to Electronic Transformation," "Managing Electronic Forms," "Workflow Enhancement Technologies" and "Imaging Systems with Forms Automation." Contact: Spectrum Systems & Resources, Inc., Parlin, N.J. (908) 727-1112, Ext. 0.

APRIL 9-15

American Management Association's 66th Annual Human Resources Conference & Exposition. Chicago, April 9-12 — Registration fees: Member rate — $1,495; nonmember rate — $1,195. Contact: American Management Association, Saranac Lake, N.Y. (800) 262-9699.

APRIL 23-29

"The Evolution of Object Methods." Chicago, April 24, New York, April 25; Dallas, April 27, San Francisco, April 28 — Attendees will learn about the unification of object-oriented methods and the state of object methodologies. Contact: Rational Software Corp., Santa Clara, Calif. (408) 496-3600.

AMMES Roundtable Seminar. San Jose, Calif., April 26-27 — A two-day seminar and exhibition to discuss the benefits of Manufacturing Execution Systems software for real-time shop floor control. Contact: Manufacturing Execution Systems Association, Pittsburgh, Pa. (412) 781-9511.

Calendar announcements should be submitted at least six weeks prior to the event and include the title of the event, dates, location, theme or focus, keynote or major speakers, principal topics and a contact person, organization and phone number.

Send announcements to:

David Weldon, Associate Editor/Management, Computerworld, 375 Cochituate Road, Framingham, Mass. 01701. Fax: (508) 875-8931.

WHAT'S THE BRIGHT IDEA?

Come to SUGI 20 in Orlando and explore a dazzling array of topics including client/server technology, rapid applications development, object-oriented programming, data visualization, data warehousing, and more. Experience four days of enlightening presentations and activities, many focusing on four key topical tracks—Client/Server, Executive, Beginner's, and Pharmaceutical.

We promise to send you home with one brilliant idea after another!

To register, contact:

SUGI 20 Coordinator
SAS Institute Inc.
SAS Campus Drive
Cary, NC 27513
Phone 919-677-8000, x6001

SAS® Users Group International
April 2-5, 1995
Walt Disney World Dolphin Hotel
Orlando, Florida
Neil Howard, Conference Chair

SUGI 20

If you could write an open letter to IBM's Chairman Louis V. Gerstner, what would you say? We offered some IBM customers the chance to air their kudos and gripes – with service and support receiving a bit of each. Mr. Gerstner, are you listening?

Dear Mr. Gerstner,

Now that we're into 1995, I thought I'd take a minute to write to tell you what I liked best about IBM in the past year and what I think could use improvement. So here goes:

I'd term your various support services as excellent. The AS/400 Advocate Service is a welcome addition. Now, on the other end of the line, there is always someone who is knowledgeable in the AS/400 and OS/400 or who can route me to the appropriate expert. That saves time and trouble.

Support has also been solid through your branch marketing teams, and your customer engineer support people also continue to excel. We take our CE's advice under heavy consideration because it is so often right.

On the technical side, your Advanced Series AS/400 has delivered some great price/performance for us.

And the new 440 Series 9337 disk drives have been a plus in several ways. For starters, these drives help us save in terms of footprint, wa need fewer boxes because we get 2G bytes in a 1G-byte space. If yours is a shop like ours that adds up gigabytes to reach the terabyte range, you start becoming concerned about floor space. Fewer but larger-capacity drives means we're getting more for our buck. And certainly, fewer disk drives are greener and cheaper to run because you don't need as much electrical power to drive and cool them.

We're also thrilled that Opticonnect has finally made it out of the lab!

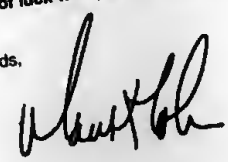
Best of all, your restructuring and downsizing have given us a gift — lots of good people to hire. We currently have five former IBMers on our staff, including network technicians, people running our PC department and software developers. In fact, our nickname here in St. Louis is "IBM West."

That's the rosy side. But there are areas that need some work.

- Access to experts. While restructuring and downsizing have brought good people to us, they have also meant there have been too many good people lost at IBM. Your resources are constrained. The expertise is there, but it's not as free and easy as it used to be.
- Packaging of the Advanced Series AS/400s. These machines just look awful in our multimachine computer room! They look so awful that we put a couple of lava lamps on top of two of them, set up a TV between them, put someone in an armchair in front of them with popcorn and took an 8- by 10-in. glossy — which wa sent to some of your AS/400 people. The AS/400s look like a couple of stereo speakers sitting in our 9,000-sq.-ft. space.
- The "interim" status of OS/400 Version 3 Release 0.5 — Fish, visitors and interim releases smell in three days.
- PC hardwara availability — Talk about virtual.
- PC Communications Manager 2 — It's fairly weak in error recovery and a drag on the network.
- IBM's billing system — Your billing practices are legacy all the way; they haven't changed in 25 years, and they look like it.
- Undocumented OS/400 logic — We found out the hard way that some undocumanted operating system logic, in the area of disk mirroring, exists for the AS/400.

That's about it. All in all we can't complain. Best of luck with your recent changes in 1995.

Regards,



Marc Cohn
Senior vice president of information systems
Enterprise Rent A Car Co.
St. Louis
Environment: 18 AS/400s, with another planned;
1.5T-byte 440 Series 9337 disk drive;
PS/2 number 1,000 installed in January

Dear Mr. Gerstner,

Santa Cruz County concluded several deals with IBM last year, namely, some new processors and disk drives. We felt IBM did the right thing for us in 1994, and that's the bottom line. Frankly, we would like to see you keep it up.

We need five things from you (and our other technology vendors):

- Products that work as they are supposed to, the sine qua non. IBM has done this very well for years; keep it up!
- Outstanding maintenance service, on site, 24 hours a day, seven days a week. IBM's local maintenance branch works really hard to be part of our team.
- Healthy, competitive third-party software and used hardware markets. IBM can't be the best at everything, and IBM's third-party software market offers the best choices in the industry. The used IBM hardware market gives us good residuals and leverages our investments. IBM benefits greatly from the presence of these markets and should work to keep them healthy.
- Aggressively producing new technology that solves real business problems. IBM hardware and operating systems fall into this category, but IBM's software and systems integration middleware don't. We use many different vendors and have to hassle systems integration. This is not desirable.
- Aggressive, competitive pricing.

IBM will win our business in the future only with steep discounts, local government pricing, real quality, leading-edge technology that works and strong residuals.

Very truly yours,

Luther Perry

Luther Perry
Information services director
Santa Cruz County
Santa Cruz, Calif.

Environment: IBM 9672 CMOS mainframe,
IBM 9394 Ramac DASD,
2,000 mixed-vendor terminals and PCs.
Network runs entirely on Token Ring,
including mainframe IBM SNA.

Dear Mr. Gerstner,

Our company, Chelsea Milling Co. (we make the well-known Jiffy brand mixes), has been a long-time user of IBM equipment and services. We have evolved over the years from the Syetem/32, System/36 and now use the AS/400. For the most part, our relationship with IBM has been very good, but that seems to be changing.

In the early years, IBM provided outstanding service. I'd like to relay an inetance of that. We were upgrading the AS/400 to Version 2 Release 2. I had set aside a weekend to do a complete backup on a 9347 tape drive and upgrade the operating syetem. It was about 6 p.m. on a Saturday, and I eturted getting media errore. I called my customer engineer support person to get some aseistance, and he discovered it was a damaged tape, not the tape drive. He could have just told me to order new tapes and hung up, but he did not. He drove more than 100 miles, into another state, to an office that had another set of tapes. He brought them to my location and waited with me until I got past the sticking points. My upgrade proceeded flawleesly.

But since then our service seems to have suffered. Last year, our company switched to an alternative method of hardware maintenance in which we contracted with an insurance underwriter that reimburses us on a time and materiale basle for the work done by whomever we call to do the repairs. This method lets us keep all of our equipment under one contract. We call IBM for the actual repairs and pay for time and materiale but no longer pay the company for maintenance. Such a contract works well for us with one exception – IBM has lost interest in helping us. IBM people haven't responded as quickly and have let us know we wouldn't be having these problems if we had continued on the IBM maintenance plan. The ironic thing is, IBM was getting more money from us when we had no contract with it at all!

As a result of the slower response times, we now use another company to handle our maintenance needs.

Sincerely,

Sherry L Desbrough

Sherry L. Desbrough
MIS director
Chelsea Milling Co.
Chelsea, Mich.

Environment: IBM AS/400,
BPCS Integrated Software,
IBM PS/2s and ValuePoint PCs,
IBM terminals, memory and EMC DASD

Dear Mr. Gerstner,

My biggest concern is with service. IBM's service has always been good, especially for us because we used to be an IBM Credit Union and we're right across the street from your Kingston, N.Y., plant.

But now the Kingston plant is closing, and as with such closings, good people go to other plants or leave. The availability of people and parts isn't at its previous levels.

It takes more of a concerted effort to make sure IBM people get here to help us and that they're qualified. Qualification is an issue because there are now fewer support people covering more territory who have to become adept at many different pieces of hardware.

Sincerely,

Lawrence E Wonderly

Lawrence E. Wonderly
Vice president of MIS
Mid-Hudson Valley Federal Credit Union
Kingston, N.Y.

Environment: IBM ES/9000 9221 Model 170
loaded with IBM 3380 DASD
and IBM 9345 DASD.
IBM 3720 communications controller;
Novell, Inc. LAN running 60 PCs,
both IBM and non-IBM, with a
terminal count of 110.

OBJECT WORLD

Objects In The Real World 1995

UPDATE No5

Don't miss Object World Boston. Sign up for your FREE Exhibits Pass—a $50 value!

FREE

Maybe three days at Object World Boston won't make or break your career. But why take chances? Come to the only all-OT, east coast event that focuses on both the technical and business aspects of applying object technology in the real world. Join us for three days of exhibits, Bonus Sessions, Exhibitor Seminars, Keynote Presentations, and special events. It's all FREE. To preregister, call (800) 225-4698 or complete and return the reply form below by March 15. Or simply bring it to the show. Don't get lost in the shuffle. Come to Object World Boston.



Your FREE exhibits pass—a $50 value—is your ticket to:

Three days of exhibits. The Object World exhibit hall will be overflowing with excitement as more than 75 companies present the hottest new products and services in object technology.

Attend Exhibitor Seminars. These dynamic sessions are your chance to learn directly from the people who design and create OT products. Find out about the most up-to-date tools and services and how they're being applied.

Hear from industry leaders. They've been there. They've seen it. They've done it. And now the movers and shakers of OT are eager to share their knowledge and experiences with you. Don't miss Object World's daily keynote addresses.

Get the inside story at our Bonus Sessions. Learn the ins and outs of object technology during several 45-minute sessions open to all attendees. Topics covered include: Focus on OMG, Standards, Introduction to OT Concepts, and Industries in Action covering healthcare, financial services, and telecommunications.

Buy autographed copies of OT best sellers. Meet noted industry authors and walk away with your own personally autographed copy of the latest titles in OT. Look for Quantum Books on the exhibit floor.

Test drive the Information Superhighway. Cruise down the open road on any of our Internet Terminals. Access the new electronic frontier including the World Wide Web. Look up your local weather forecast. Take part in group discussions. Tap into research on computer companies.

Vote for your favorite new product. Witness live demonstrations of new products and tell us which one you think is best at the 2nd Annual Computerworld Best New OT Product Awards Competition. Both the Attendees' and Industry Judges' Choice winners will be announced on the show floor on Wednesday, March 22, at 4:30 p.m.

Tip your glass at the Boston Beer Tasting Reception. Belly up to the bar and sample beer from famous Boston area breweries like Samuel Adams, the Commonwealth Brewery and others on Wednesday, March 22, at 5:00 p.m.

Receive valuable show coupons. Save on the latest in hardware, software, and services with hundreds of dollars worth of discount coupons good only at Object World Boston.

Get the Object World Facts by Fax!

Call our 24-hour automated fax system at (800) 486-9808 and request the following extension for up-to-the-minute information:

Bonus Sessions & Exhibitor Seminars: Ext. 496

Tutorials & Conferences: Ext. 494 or 495

Book Signings: Ext. 497

A special thanks to our special events sponsors:

digital IBM MARTIN MARIETTA ADVANCED CONCEPTS CENTER

EXHIBIT HALL HOURS		
Tuesday March 21	11:00 a.m.	6:00 p.m.
Wednesday March 22	11:00 a.m.	6:00 p.m.
Awards Ceremony	4:30 p.m.	5:00 p.m.
Beer Tasting Reception	5:00 p.m.	6:00 p.m.
Thursday March 23	10:00 a.m.	2:00 p.m.

The biggest names in OT will display their products and services at Object World Boston.

ACM SIGAda • ADA Information Clearinghouse • AMS Training Services • *Application Development Trends* • Boston University Corporate Education Center • Cadre Technologies • *Computerworld* • Covia Technologies • The Cushing Group • *Data Management Review* • DDC-I • Digital Equipment Corporation • Easel Corporation • Expersoft • Extended Intelligence • Fujitsu • Hitachi • IBM Corporation • ICL • ICON Computing, Inc. • ILOG, Inc. • *InfoWorld* • Instruction Set, Inc. • IntelliCorp, Inc. • Interactive Development Environments • Intersolv, Inc. • IONA Technologies, Ltd. • JumpStart Systems, Inc. • Learning Tree International • Logiscope Technologies • Mark Winter & Associates • Martin Marietta Advanced Concepts Center • *Mass High Tech News* • Matra Datavision • McCabe & Associates, Inc. • Micro Focus • Miller Freeman, Inc. • NetLinks Technology, Inc. • Object Management Group • *Object-Oriented Strategies* • Objectory Corporation • Object Power • OpenObjects • OpenWare Technologies, Inc. • ParcPlace Systems • Powersoft Corporation • Prentice Hall • Proforma Corp. • Project Technology • ProtoSoft, Inc. • Ptech, Inc. • Rational Software Corporation • Rogue Wave Software Inc. • Select Software Tools, Inc. • Semaphore • Servio Corporation • SES, Inc. • SIGS Publications • Software 2000, Inc. • *Software Magazine* • SPL World Group Consulting • SunSoft • Synnx Corporation • Taligent • Taskon Work Environments • Texas Instruments • Unigram-X • UniSQL, Inc. • Winter, Wyman & Co.

Hear Keynote Presentations from Industry Leaders.

• ***Objects: Not Just for Programmers Anymore.***
Tuesday, March 21, 10:15 a.m. - 11:30 a.m.
Keynote Speaker: **Steven A. Mills**, General Manager, IBM Software Solutions

• ***Business Engineering with Object Technology.***
Wednesday, March 22, 10:15 a.m. - 11:30 a.m.
Keynote Speaker: **David A. Taylor, Ph.D.**, President, Enterprise Engines Inc

• ***Theory is Great, But Does it Get the Job Done?***
Thursday, March 23, 9:00 a.m - 10:30 a.m.
Keynote Moderator: **Jon Hopkins**, President, Palladio Software Corporation
Keynote Panelists: **Grady Booch**, Chief Scientist, Rational Software Corporation, **Ivar Jacobson**, Ph.D., V.P., Technology, Objectory AB; **Stephen J. Mellor**, V.P. and Founder, Project Technology, Inc.

Need more information about Object World Boston conferences? Call (800) 225-4698.

It's easy to register

BY PHONE: Call us toll free at (800) 225-4698 in the U.S. or (508) 879-6700. Please complete the registration form before you call.

BY MAIL: Fill out this form and mail to IDG World Expo, 111 Speen Street, P.O. Box 9107, Framingham, MA 01701.

BY FAX: For fastest service, fax us at (508) 872-8237.

BY WORLDWIDE WEB SERVER: To access: http://www.idgwec.com Select: Object World Boston.

Object World Boston • Hynes Convention Center • March 21-23, 1995

Return this coupon by March 15. Or bring it to the show for your FREE admission—a $50 value.

The last date to preregister is March 15. After that date, simply bring this form to the show for FREE admission. To avoid long lines at the door, register by March 1 and your exhibits pass will be mailed to you approximately two weeks before the show. You must complete Sections A-G.

Please print or type clearly. Photocopy to register additional people. No one under 18 admitted.

❑ Please register me for my FREE Exhibits pass.
❑ Please rush me complete conference information.

Priority code: CWB

Be There Or Be Square.

A. NAME _____

TITLE _____

ORGANIZATION _____

STREET _____

CITY _____ STATE/PROVINCE _____

ZIP/POSTAL CODE _____ COUNTRY _____

PHONE _____ FAX _____

B. Your Business or Profession (Circle one)
1. Aerospace
2. Consultant
3. Education
4. Engineering
5. Government
6. Information Service
7. Insurance/Banking/Financial
8. Manufacturing
9. Professional Service
10. Retailing
11. Software Developer
12. Wholesaling/Distribution
13. Other

C. Your Title
14. Chief Information Officer
15. Consultant
16. EDP System/Program/Planning
17. Software Engineer
18. Engineer (other than software)
19. General Management
20. Information Systems Manager
21. Manager, System Architecture
22. Manager, System Development
23. Marketing/Sales
24. Member of Technical Staff
25. MIS/DP Manager
26. Programming Supervisor
27. Software Development Manager
28. Technology Planning Manager
29. Project Manager
30. Technical Manager
31. Software Developer
32. Development Manager
33. Researcher
34. Programmer
35. Other

D. Number of Employees in Your Company.
36. Under 100
37. 100-499
38. 500-999
39. 1000-4999
40. Over 5000

E. Which Purchases Do You Perform in Regard to Object Technology?
41. Final Decision Maker
42. Specify
43. Recommend
44. Approve
45. Develop/Use
46. Resell
47. Other

F. In Which of the Following Object-Oriented Products or Services Are You Interested?
48. C++
49. Smalltalk
50. Eiffel
51. Frameworks
52. Analysis and Design Tools
53. Visual Programming
54. Portable GUI Environments
55. Development Environments
56. Distributed Management Facility
57. Class Libraries
58. None
59. Databases

G. Internet/E-mail Address

❑ Check here if you are disabled and require special services. Please attach a written description of your needs.

Object World Boston is sponsored and produced by:

IDG WORLD EXPO COMPUTERWORLD

DISTRIBUTED APPLICATIONS FOR THE REAL WORLD
OBJECT WORLD

Conference Call



Computerworld's Corporate Technical Recruiting Conference
Suburban Denver, Colorado
June 11-14, 1995

For more information, call
1-800-488-9204

---

*Clip and **FAX** this coupon to **1-508-875-3202** or call **1-800-488-9204** for more information.*

Please place my name on your mailing list, so I'll receive registration materials and information throughout the year.

Name _____ Title _____

Company _____

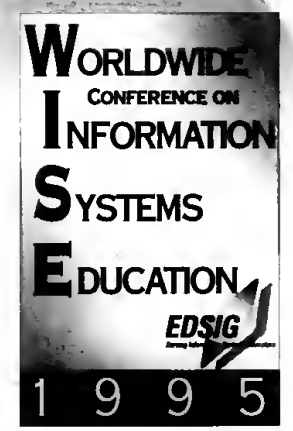
Address _____

City _____ State _____ Zip Code _____

Phone _____ Fax _____ e-mail _____

CTRC

Conference Call



EDSIG's Worldwide Conference on Information Systems Education
Suburban Denver, Colorado
June 11-14, 1995

For more information, call
1-800-488-9204

---

*Clip and **FAX** this coupon to **1-508-875-3202** or call **1-800-488-9204** for more information.*

Please place my name on your mailing list, so I'll receive registration materials and information throughout the year.

Name _____ Title _____

institution or Company _____

Address _____

City _____ State _____ Zip Code _____

Phone _____ Fax _____ e-mail _____

WISE

Testing fate

Companies don't test for technical proficiency as often as they should, but when they do, mainframe expertise is still on the list

By Harvey Bookman

Programmers may get away with huzzword double-talk in technical interviews, hut as many of us know, talking technical is not the same as being technical.

And if a smooth-talking programmer schmoozes his way into a project he can't bandle, it can spell disaster. A nonproficient programmer on a 10-man project can actually decrease output hy more than 10% if his team members have to spend time fixing his mistakes.

In a perfect world, all information systems joh applicants would be tested for technical know-how. But in reality, the primary method for qualifying hires is still the traditional interview, despite studies that indicate it offers mixed results. Interview-only screening methods often fail because interviewers lack the experiise to spot exaggerated technical accomplishments. Moreover, questions are often geared toward technologies with which the interviewer is most familiar or material that is easily memorized.

Technical tests, on the other hand, are objective, consistent, color-blind and gender-indifferent. Test statistics can be correlated, producing percentiles of relative and objective ability.

Tests should assess the technical skills required to perform a job proficiently. If the test is simply theoretical, the answers might be memorized by someone who has simply read a book on the subject. Done right, tests can simulate actual job situations. But tests cannot determine whether an individual fits into a corporate work environment or has a good work attitude.

Testing advantages

Slowly, the benefits of testing are starting to show, and, surprisingly, companies are still looking for proficiency in legacy systems. For example, in the past three months, companies purchased more Cobol, CICS and DB2 tests from Bookman Consulting, Inc., a software de-

Testing fate, *page 131*

Still testing mainframe aptitude

The demand for skills in the newest languages is hard to ignore if you've ever perused the help wanteds, but companies haven't stopped looking for proficiency in other areas. Information gathered from Bookman Consulting's, database of 125 employers that use its programmer proficiency tests illustrates this.

Q. Which proficiency tests would you expect to be the most in demand: PowerBuilder, Visual Basic or CICS tests?

A. You may be surprised to hear that, from what we've seen, the CICS test outsells the PowerBuilder and Visual Basic tests combined.

Q. What about the battle among Oracle, Sybase and IBM's DB2?

A. Companies in our database have bought approximately 2½ times more Oracle tests than Sybase tests. Moreover, DB2 beats Oracle by 50%.

Q. Is MicroFocus PC Cobol replacing mainframe Cobol?

A. Mainframe Cobol tests are used more than 30 times as much. Cobol still leads over C. In object-oriented languages, C++ tests are 10 times more common than Smalltalk tests.

Source: Harvey Bookman, Bookman Consulting, Inc., New York

Let Your Career Soar into the 21st Century with the Eagles!

Eagles is an internationally recognized leader in emerging technologies consulting services. Our advanced technologies group has immediate requirements for the following divisions.

OO Development Technologies
C++ and Smalltalk
S.A.R. R/3 Development
Client-Server Technologists
UNIX Systems Administrators
Oracle 7 DBAs
IMF Developers
Sybase DBAs

Mail or fax your resume to:

EAGLES

EAGLES INTERNATIONAL, INC.
15851 Dallas Parkway, Ste 501
Dallas, TX 75248
Voice (214) 450-5900 (800) 800-6785
Fax (214) 450-5901

SOFTWARE DESIGN ENGINEERS

APPLY YOUR SOFTWARE KNOW-HOW TO THE GAMEWARE CHALLENGE.



Today in Orlando, Florida, Martin Marietta Information Systems is laying the groundwork for a whole new game. We're quickly expanding our lead in the development of sophisticated entertainment and virtual reality applications through on-going contracts with entertainment giants such as Sega. Take advantage of our success as your springboard to the world of video arcade and consumer gameware.

To succeed in this arena, you must be a creative, artistic team player who offers strong interpersonal and technical skills and high enthusiasm for video arcade and/or home entertainment games. You should also possess a BS in CS, EE or equivalent and 2-5 years' experience that demonstrates solid game programming skills. Experience with C, Assembly language and microprocessor programming is desirable, as is a background in commercial system development.

Your code could be the driving force behind the next game that sweeps the field. If you're up to the challenge, please fax your resume to Dept. OA9502R at (703) 821-3521 or mail to our central staffing office at: Martin Marietta, Dept. OA9502R, P.O. Box 8048, Building 10, Room 1019, Philadelphia, PA 19101. An equal opportunity employer.

MARTIN MARIETTA

GET SERIOUS

If you're serious about a career in consulting, seriously consider CTG. With nearly 30 years of experience and a client list that includes the majority of the Fortune 100, CTG can offer you the challenge and support you need to succeed. Opportunities are currently available in the following areas:

JACKSONVILLE, FL: • COBOL, CICS, DB2 • Oracle • Sybase • PowerBuilder • Visual Basic • Banking Apps.

NASHVILLE, TN: • COBOL, CICS, DB2 • Sybase DBA • AS/400, RPG • PowerBuilder/Visual Basic • Oracle • Ingress • DEC/VAX COBOL • ADW/IES

ATLANTA, GA: • Teradata, SQL, COBOL II • VAX, RDB, COBOL, PA, DBA • AS/400, RPG • UNIX System Admin • Windows NT, C • Smalltalk • Peoplesoft • MVS COBOL • UNIX, Informix 4GL • UNIX, C, Sybase • DB2, CICS, COBOL • Access, FoxPro

MEMPHIS, TN: • IMS, DB/DC • CICS, DB2 • AS/400, RPG/400 • DB2, DBA • VAX/VMS, Fortran, DEC Forms • UNIX, C, C++ • HP Image

TAMPA, FL: • DB2 • CICS • Oracle • C/OS2 • Tandem • IMS DB/DC • Rexx/VM/CMS • C++/OOD/OOP • PL/1/SAS/M204 • SUPRA/MANTIS • SOFTWARE QA • Sybase—CT/LIB, DB/LIB • LAN Installation Support • VTAM, SNA, Lease Line Support • Technical Writer/Editor • Desktop Pub/Data Entry • VAX/UNIX Syst. Admin. • PowerBuilder/WATCOM • C/UNIX/SHELL SCRIPTING • Data Communications, TCP/IP, AS/400, Novell • AS/400/EDI/GENTRAN/RPG/400 • FoxPro • American Software • LAN WAN • C/AS/400

ORLANDO, FL: • AS/400, RPG/400 • CNE • CNA • UNISYS/COBOL • Informix • PowerBuilder • SUN/UNIX • Anderson Consulting • Sybase • Millennium • Smalltalk • Enfin

FT. LAUDERDALE, FL: • AS/400 • RPG/COBOL • Driver Developers • IDMS • COBOL, CICS, DB2 • Oracle, Form 2.0, 4.0 • C, OS2, Debugging Tools

If you're serious about your consulting career, make the right choice. Choose CTG. For more information, send your resume to:

CTG - Southern Region Sourcing Center
Dept. CW2220, 5730 Oakbrook Pkwy
Suite 105, Atlanta, GA 30093-1825
Phone: 800-788-2159 Fax: 800-445-5382

For information about opportunities nationwide, contact the regional sourcing manager nearest you.

Northeast: Ph. 800-372-5852 / Fx. 800-586-5274
Central/West: Ph. 800-345-7782 / Fx. 800-549-1636
Midwest: Ph. 800-214-2820 / Fx. 800-214-2720
Mid-Atlantic: Ph. 800-851-6577 / Fx. 800-847-9862

EOE M/F/D/V

ctg

Object Oriented and Career Minded?

Senior Level Project Managers with strong experience in Object Oriented Open Systems Technology needed to facilitate expansion of a quality driven Systems Integration business.

Positions available in Tampa Florida, Austin Texas, New York City, Los Angeles California, Boulder Colorado, Washington D.C., and other locations by Client requirements. Immediate relocation not required if reading near any major city airport.

Excellent Benefits and Salary commensurate with experience. Relocation assistance provided.

For consideration, mail or FAX resume to:

Business Partners, Inc.

ATT: OOUJ, 1531 N. Dale Mabry Hwy., Suite 102, Lutz, FL 33549. FAX (813) 948-1450.

An Equal Opportunity Employer.

PROGRAMMERS/ CONSULTANTS
Florida Opportunities

Long term consulting assignments in Florida and nationally for consultants with the following skills:

- COBOL/CICS
- IMS DB/DC
- MEDICAID/MEDICARE
- MICROFOCUS COBOL
- CLIENT SERVER
- CLAIMS/TRANSACTION PROCESSING
- OTHER TECHNICAL SKILLS

Please contact:
LENCO COMPUTER CONSULTING
1648 Metropolitan Circle, Tallahassee, FL 32308, (800) 405-2626, (904) 422-3183 (FAX)
310 Bear Hill Road, Waltham, MA 02154, (617) 890-7555, (617) 890-0004 (FAX)

THE LENCO PRO
Computer Consultants

PROGRAMMER/ANALYST (2 positions) 40 hrs/wk, 8 a.m. - 5 p.m. $43,800/yr. Analyze, develop, code and test computer software application systems on IBM mainframe and UNIX environment utilizing MVS, DB2, COBOL, CICS, UNIX and C. Prepare program specifications, test plans and test cases, provide assistance in systems implementation. Reqr Bachelor's Degree in Computer Science or Electronics Engineering. Reqr 3 yr exp in job offered, or 3 yr exp as Systems Analyst/Programmer and/or Software Engineer. Reqr work expr in development of s/w systems on IBM m/f utilizing DB2, CICS, COBOL, UNIX and C. "Employer paid ad." E O E Send resumes to: 7310 Woodward Ave., Rm 415, Detroit, MI 48202. Ref No 32395

Central OH Computer & Data Processing Consulting firm seeks software engineer to design, develop and implement distributed system to provide interactive on-line service. Software capabilities include ability to create, search, retrieve, download messages and real-time conferencing with other users of system. Software operates in Windows NT operating system utilizing networking technology and object-oriented techniques with existing system operating on UNIX platform. Resp incl maintenance of existing UNIX based system. Req M.S. in Computer Science and 7 years or job described, or related exp with design & development of distributed systems, design & development of network protocols, strong C, C++ and assembly programming languages. Exp may be before or after degree. 40 hrs/wk, 8:00 - 5:00, Mon. - Fri. $73,00/hr. Send 2 resumes & cover letter (no calls) to T. Do, Job 00894, Ohio Bureau of Employment Services, PO Box 1618, Columbus, OH 43216

SOFTWARE ENGINEER Two Engineers needed to design part-code (in C) manage project as add RF wireless connectivity to IBM 4680 POS terminals controllers in joint project w/IBM and Telxon. Ensure on-schedule completion of development work undertaken in OS/2 environment. Customize wide development environment tools to suit project development using Awk, Make, Rexx, OS/2 batch files. Provide technical marketing assistance for company officers in strategic customer calls. Research, write design feasibility studies for customers. Provide technical consultancy for personnel in areas of communication protocols and strategies particularly when applied to 4680 retail environment e.g. the Remote Operator Provide consultancy & debugging assistance for host communications problems w/IBM 4680 POS code in areas of SNA PU2.1, SNA LUO, Token Ring, SDLC, SNA 3270 and SNAPS a/w 8 S E E. 5 yrs exp as S/W Eng w/ Sr Project Leader exp in following programming languages C, Pascal, Basic, 8WK, Assembler. Communications protocols SNA OSI. Operating Systems IBM 4680, UNIX, DOS, OS/2, VM. Indepth knowledge of IBM 4680 POS driver OS architecture and its communication subsystem. Exp must include detailed knowledge of communications architectures as they exist on IBM 4680 POS controller specifically SNA type 2.1 nodes, SNA LUO application programming interface (API), SNA LUO protocol, SNA 3270 protocol, Token Ring X.25. Must be able to provide s/w support (debug and trg) consultancy. Must have exp w/writing drivers for RF adapters and w/IBM POS store loop system. Must be able to maintain, develop wireless store loop drivers. 40 hr/wk ($48,675 - $68,400 yr). Apply to Job Service, 700 Wade Ave., P.O. Box 27227, Raleigh, NC 27622, or nearest Job Service office. JO#NC7242818. OOT 030.062-018. All resumes must have SS#s.

Communication Software Engineer for software co in S Ohio. Duties: Design & develop workstation product in MS Windows and MS-DOS environments based on client/server/lab design and implementation approach, using C and C++ languages, develop enhance & maintain CASL script language including compilation and run time modules and GUI-based end user tools, develop end user personnel productivity products using functional separations, prototypes & design specifications, design & develop graphical user interfaces for terminal emulation tool components, such as configuration and installation over Unisys INF/DConnect architecture & ensure compatibility of designed & developed software with Unisys OS 1100/2200 and A/V Series mainframes. Requires: MS in Computer Science or Information Science. MS must include coursework or graduate research in compilers, graphics, operating systems and analysis of algorithms. Coursework or laboratory work must also include object-oriented design and programming using C and C++ languages in various operating environments, including MS-DOS, and the use of Windows based end user interface software. No exp required. EOE. 40 hrs/wk, 8:00 a.m. to 5:00 p.m. Salary $39,500/yr. Must have proof of legal authority to work indefinitely in the U.S. Send 2 resumes & cover letters (no calls) to T. Do, JO#: 00894, Ohio Bureau of Employment Services, PO Box 1618, Columbus, OH 43216

Programmer/Analyst work at client sites in Boca Raton FL & Company's premises also in Boca Raton. Develop presentation server apps for Windows OS on Power PC. Intel 486. Perform Develop graphics for OS/2. Provide technical support. Utilize OS/2 2.1, IBM C/Set 2, Toolkit, Workframe, Microsoft SDK. Bachelors/Computer Science, Math or Engineering. 2 years experience in job offered or 2 years as Consultant or Systems Programmer. Related occupation must include 2 years experience using OS/2 2.1, IBM C/Set 2, Toolkit, Workframe, Microsoft SDK. 40hrs/week, 8am-5pm. $52,000/year. Send resume to Job Service of Florida, 2660 West Oakland Park Blvd., Fort Lauderdale, FL 33311-1247. Ref. Job Order Number FL 1185823.

Developmental Software Engineer for program mgmt. and process engineering firm. Resp. within a design team to identify and implement a strategy for transit entire manual engineering and sales systems from mainframe environment to client/server environment, business process re-engineering of financial and manual depart. collect and analyze data reqts, design physical database structure, create and write C and Pro C system and program code, write conversion routines for imported data, system utilities for ORACLE transact package and UNIX Bourne Shell scripts, extensive use of ORACLE RDBMS (6.0, 7.0) and supporting tools, and ORACLE Financial Release 8.8 including ORACLE Application Library 5.0.16, ORACLE Revenue Accounting 5.0.16, ORACLE General Ledger 7.0.24, and ORACLE Order Entry 3.0 and others. MIN QUAL: MS - Computer Science, 2 yrs exp as Computer Programmer/Analyst. Exp must incl: 1) Distributed ORACLE database environments and software, 2) SQL*NET and Transport Control Protocol/Interface Protocol for multiple environments, 2) C and Pro*C programming code for creating enhancements/extensions to ORACLE applications and UNIX Shell programming, 3) The following ORACLE tools: SQL*Forms 2.3, SQL*Report, SQL*Report writer, SQL*Loader and PL/SQL. M-F, 8am - 5pm, $1,925.77 bi-weekly. Employer Paid Ad. Send resume to Michigan Employment Security Commission, 7310 Woodward Ave., Rm 415, Detroit, MI 48202. REF #27995

Sr. Systems Engineer for a computer services public corporation in Columbus OH. Manage technical team that provide architect solutions for large state organizations including mainframes, telecommunications, LANs, build development environments for programming teams including code libraries, migration procedures, programming standards & completed code walk throughs, troubleshoot problems with communication between mainframe, TI communication links & LANS, provide usability on MS-DOS V6.2 or higher & Microsoft Windows 3.1 or higher MVS/ESA mainframe JCL, VS-COBOL II, CICS, ROSCOE, TSO, Banyan VINES, Local Area Network Operating System, SUPRA mainframe database management system, SUPRA Server, OS/2 database management system, NetConnect database gateway product programming, OS/2 database management system, NetConnect database gateway product programming, OS/2 using REXX and SOM, NetBIOS named pipes and APPC/LU 6.2 communication protocols. Requires: Associates Degree (Foreign or Domestic) in Computer Systems Technology, 4 yrs exp in job described or 4 yrs systems engineering and/or Systems Analyst exp verifiable references, 40 hrs. per wk, 8am-5pm Mon-Fri, $58,000/yr. Send 2 resumes & cover letters (no calls) to K. Shadley, Job #00896, Ohio Bureau of Employment Services, PO Box 1618, Columbus, OH 43216

Systems Engineer, 40hrs/wk, 8am - 5pm, $42,000/year. Evaluate software engineering projects for computer consulting company. Develop computer information systems including data communications across multiple platforms linked by a single network. Conduct feasibility studies, technology assessments, system design and testing for batch and on-line systems. System documentation. Tools: CSS: OS/2, NTM, COBOL, IMS (DB/DC), JCL, MVS/ESA, TSO, DB2, Easynews Plus, CICS, CONCURRENT. "M.S. in Computer Science or Management Information Systems as well as two years experience as a Systems Engineer or Systems Analyst required. "M.B.A. with 10 credit hours in management information systems is acceptable in lieu of M.S. Previous experience must include COBOL, MVS/ESA, IMS (DB/DC), Easynews Plus, DB2, (SQL/DS), PL/1, SAS, CSP, Quattro Pro. Must be willing to attend training in CONCURRENT. Must have proof of legal authority to work permanently in the U.S. Send two copies of resume to ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 3 South, Chicago, IL 60605. Attention: Sheila Lindsey. Reference #V-IL-12458-L. NO CALLS. An Employer Paid Ad.

Computer Software Consultant for computer and engineering systems contractor. Consult with engineers to gather and modify data and determ. data reqts and logical structuring and warehousing of data, integ engineering and finance reqts, create and maint computer database systems, solutions for engineers and science personnel, design and develop Relational Database Management Systems (RDBMS), and back-end manip of data as well on Graphical User Interface (GUI) front-end applic. devel and support maint/server applic. evolving CAD/CAM (Concurrent Engineering), Microsoft Access, Visual Basic, and Sybase (SQL) in multi-user environ. MIN QUAL: M.S. Industrial Engineering, 1yr exp as Graduate Research Asst. Acad. pres must incl Master thesis involving Intelligent Concurrent Engineering for CAD/CAM graphical database and RDBMS system integration. Must demonstrate a commitment to research as evidenced by one or more refereed journal articles. Exp must incl programming for client/server appic in a concurrent engineering environ involving CAD/CAM, Microsoft Access, Visual Basic, and Sybase (SQL). M-F, 8am - 4:30pm, $30,736/yr. Employer Paid Ad. Send resume to Michigan Employment Security Commission, 7310 Woodward Ave., Rm 415, Detroit, MI 48202. REF #28195

SENIOR SOFTWARE ENGINEER 40 hrs/wk, 8 a.m. - 5 p.m. $48,300/yr. Analyze, design and develop computer s/w application systems on IBM m/f computers utilizing MVS/ESA, CICS, DB2, COBOL, and CSP/ADAE. Provide quality assurance on project carry out system testing, troubleshooting and act as project/user liaison. Requires: Bachelor's Degree in Computer, Electrical, Mechanical or Industrial Engineering or Operations Research. Reqr 5 yrs. exp. in job offered, or 5 yrs. exp. as Systems Analyst/Programmer. Reqr exp. in job offered or on Systems Analyst/Programmer must include 3 yrs. experience in analysis, design & development of application s/w on IBM m/f utilizing MVS/ESA, CICS, DB2, COBOL, and CSP/ADAE. "Employer paid ad." E.O.E. Applicants should submit resume to the Job Service of Florida, 2660 W. Oakland Park Boulevard, Fort Lauderdale, Florida 33311-1247. Reference Job Order #FL-1184136

Manager, Computer Network Operations. Manage and supervise staff of 7-10 responsible for local and wide area network operation of admin. testing, academic computing and instructional laboratory networks (250+ stations). Configures, installs and maintains networks capable of performing electronic mail, running applications, exchange info in multi-platform environment (DOS, windows, unix, macintosh, OS/2). Equipment and software selection, pricing and procurement, plan and design networks for current and future technology. Bachelor degree: computer & systems engineering, ability to operate software on both MS DOS and Macintosh platforms. Knowledge of microsoft/unix windows configuration and memory managers. Familiarity with industry standards and protocols, especially TCP/IP. Familiarity with large mainframe operations (IBM 3081), novell 2.2 and 3.11 network operating systems, ethernet, topologies, WAN, 10 Base T, TCP/IP, internets, SNMP, and OSI protocols. Salary range $31,861-$47,604. Submit resume to Job Service of Florida, 701 S.W. 27 Ave., Room 97, Miami, Florida, 33135-3014. Reference Job # FL-1188331

Programmer/Analyst greater Boston area. Develop graphical user interfaces, enhance & modify programs & software in RDBMS environment, write specifications, provide technical support. Use SYBASE, C++, Smalltalk, MOTIF. Bachelors/Comp. Sc, Engg or Math, 18mos/exp in job offered or 18mos as Software Engineer M.S. in Comp. Sci will be accepted in lieu of 12 mos/exp. Job offered or related acc. must include 6mos using SYBASE C++, Smalltalk, MOTIF. 40hrs/wk (8-5 M-F). $45,000/yr. Send resume in duplicate to Case #50169, P.O. Box #8988, Boston, MA 02114

DIRECTOR OF TECHNOLOGY SYSTEMS & SERVICES

The Des Moines Public Schools with over 3,800 employees and 31,000 students is seeking an individual to direct the use of technology for instruction and managing information. The position has the responsibility of providing leadership in ensuring that the proper systems are in place. The successful candidate will possess excellent communication, analytical and organizational skills.

Qualifications:
- Bachelor's degree in Computer Science or equivalent experience
- 7-10 years experience in field of technology
- 3 years supervising experience
- Experience designing, installing and operating systems
- Experience working with an external service center desired
- Experience with administration, instructional and communication technologies

If you relate effectively with others and want to deliver a quality product, submit your resume and salary history by March 10, 1995 to: Thomas E. Stokes, Director of Human Resources Management, 1800 Grand Avenue, Des Moines, IA 50309-3332. Equal Opportunity Employer

PROGRAMMER/ANALYST (2 positions) 40 hrs/wk, 8 a.m. - 5 p.m. $36,000/yr. Analyze, develop, code and test computer software applications systems on HP 9000 computer with UNIX OS utilizing ORACLE and C. Prepare test plans and test cases, provide assistance in systems implementation. Requires Bachelor's Degree in Computer Science or Computer Applications. Reqr 2 yr exp in job offered, or 2 yr exp as Systems Analyst/Programmer and/or Software or Information Technology Engineer. Reqr work expr in development of s/w systems on HP computers utilizing UNIX O/S, ORACLE and C. "Employer paid ad." E.O.E. Send resumes to: 7310 Woodward Ave., Rm 415, Detroit, MI 48202. Ref No: 32496

Systems Engineer - Develop, administer and trouble-shoot the entire company's computer systems. Train employees in the use of the company's computer hardware. Refine and adjust the purchasing and inventory control software. 9 a.m. to 5 p.m. M-F. Must have Bachelor's degree in Systems Engineering and one college course in Administration of Computer Systems and three years work experience as a Systems Engineer. Salary $500.00 per week. Submit resume to Job Service of Florida, 701 S.W. 27 Ave., Room 47, Miami, Fla. 33135-3014. Re: Job Order #FL 1197580

Systems Analyst (Consultant) metro Chicago area. Analyze design develop implement & maintain applications. Provide technical support to end users. Utilize ADSO, IDMS/R, MVS/XA, PowerBuilder, Windows, Batch sters/Comp. Sci. Data Processing or Engr. Systexp in job offered or 2 yrs. as Programmer and/or Programmer/Analyst. Experience in job offered or related occupation must include 2yrs exp. using PowerBuilder, Windows, ADSO, IDMS/R, MVS/XA, 40hrs/wk (8-5, M-F). $53,500/yr. Must have proof of legal authority to work permanently in the U.S. Send resume in duplicate to: Illinois Department of Employment Security, 401 South State Street - 3 South, Chicago, IL 60605. Attn: James Gregory. Ref. #V-IL-12133. NO CALLS. AN EMPLOYER PAID AD

SOFTWARE ENGINEER (2 positions) 40 hrs/wk, 8 a.m. - 5 p.m. $48,000/yr. Analyze design develop and implement computer software application systems on IBM mainframes utilizing MVS, DB2, CICS, SAS and COBOL. Tests team of programmer/analysts to achieve the on goals for s/w development. Requires Bachelor's Degree in Computer Science. Reqr 4 yr exp in job offered or 3 yr exp as Systems Analyst/Programmer. Reqr work expr in development of s/w systems on IBM mainframes utilizing MVS, DB2, CICS and COBOL. II and in project management. "Employer paid ad." E.O.E. Send resumes to: 7310 Woodward Ave., Rm 415, Detroit, MI 48202. Ref No: 23395.

Testing fate

CONTINUED FROM PAGE 129

veloper in New York, than from any other available skills tests. Microsoft Corp.'s Visual Basic, Powersoft Corp.'s PowerBuilder and C++ were also good sellers, but they finished well below mainframe-related skills tests.

What companies test? The likes of Mellon Securities, the U.S. Customs Service and the West Virginia Bureau of Employee Programs test on the legacy staples — Cobol, CICS and JCL. Bristol-Myers Squibb tests on CICS, Cobol II, DB2, PowerBuilder, Visual Basic and Sybase, Inc.'s database product. New York Life Insurance tests on Cobol, DB2 and C.

Consultancies are also big testers. Keane, Inc., a data processing and management consultancy in Boston uses approximately 70 tests for its consultants.

But testing comes with a price. At $50 to $300 per test, technical testing services are not inexpensive, but it's a small price to pay when shelling out thousands of dollars for the proper skills. To lessen the costs, companies might consider developing tests in-house, but the lack of expertise to write tests and insufficient staff to produce valid statistics and percentiles generally prohibit this. The development costs for a good test can easily exceed $50,000, with an additional few thousand dollars per year required for test maintenance.

Yet when push comes to shove, testing, especially for computer programmers, makes sense. Interviewers will have more time to spend evaluating the job candidate's attitude and expectations, and the result will be more objective. ■

Bookman is president of Bookman Consulting, Inc., a New York software developer that specializes in programmer proficiency testing. He developed Teckchek, an expert system testing service.

The 10 best-selling skills tests in the past three months

1. Cobol	6. Visual Basic
2. C	7. Oracle
3. CICS	8. PowerBuilder
4. DB2	9. Unix
5. C++	10. DOS

Base: 125 companies using Teckchek; Source: Bookman Consulting, Inc., New York

It pays to be sure

Have you ever hired someone who claimed to have technical experience and didn't?

"We've hired some certified Novell engineers who said they had experience but really had little hands-on knowledge. These people turned out to be disastrous. I want to make sure that they have more than book knowledge." – **John Wise**, manager, information services, Pacific Bell, San Francisco

"We have had a number of people who overcommitted their abilities. It took as three to six months to realize this. It's very expensive to lose a few months of salary and productivity." – **Steve Goodman**, director, Texas Employment Commission, Austin

"Yes. My prior firm hired a programmer for an account who supposedly had three to four years' experience in CICS and Cobol II. He talked a good game but was quickly booted out two weeks after beginning. Luckily, it was a large client that we didn't lose." – **Tom Bell**, recruiter, Keane, Inc., Denver

"It happens, but not often. A while back we hired someone who sold himself as a systems analyst. He was really a user analyst. . . Once we started giving him projects, it became pretty obvious that it wasn't going to work out." – **Joe Hunter**, IS manager, Baltimore Gas & Electric Co., Baltimore

"Yes. Every time we gave this person a particular project or task, they would put it off or ask someone else to do it. We finally had to put the person on a performance plan and eventually let them go." – **Kim Whitney**, human resources manager, Walker Interactive Systems, Inc., San Francisco

Source: Bookman Consulting, Inc., New York

CONTRACTORS!

The SEEK Consulting Group is one of the largest and fastest growing full service contract placement firms focused in the areas of Software Development and Datacommunications. At SEEK we are staffing specialists dedicated to being active partners and agents in representing both the immediate and long term interests of our clients. We've made significant investments in our people and the latest technologies, enabling us to further develop and maintain a highly sophisticated and far reaching network of contacts and relationships. Whether you are a hiring manager or a career-minded systems consultant, SEEK Consulting serves as an invaluable professional resource.

- Program and Project Mgrs, Telecom App.
- PowerBuilder/Sybase, Oracle
- Oracle Graphics
- Oracle Pro*C, Reportwriter, Forms, UNIX
- Oracle, Sybase DBA's, Developers
- SNMP, C, Unix
- SQL/Windows, Windows SDK, NT, Motif
- HP-UX System Administrators
- C++, Windows, XVT
- Mac 4D Developers
- Lotus Notes Developers
- NT Porting, Sun, C++
- UNIX Device Drivers, SCSI
- MacApp, C++
- UNIX, Informix, Oracle
- ATM, FrameRelay, C, VxWorks
- VC++, Windows, MFC
- VC++, Kernel level exp.
- Windows, DLL's, MS Test
- DOS/Windows Driver Development
- SAP R2, R3
- Real-time embedded SAW, 68HCII or 68302
- C++, Device Drivers
- MAC, Sys 7
- UNIX, System Admin.
- 4GL-Access, Oracle V7
- Oracle Financials

OPPORTUNITIES AVAILABLE THROUGHOUT THE U.S.

Learn more about SEEK, contracting opportunities, marketplace info, shareware and games by calling our Electronic BBS at 617-246-6243.

SEEK CONSULTING

Please send or fax your resume to our Corporate headquarters at: 401 Edgewater Place, Suite 0130, Wakefield, MA 01880; Attn: Dept. CW; Fax: 617-246-6240; Phone: 1-800-274-1174; Internet: jobs@seekcon.win.net.

PROGRAMMER/ ANALYST

We are a rapidly growing national company located in Cedar Rapids, Iowa, seeking an individual with 7-10 years IBM mainframe COBOL CICS VSE experience to provide data processing support. Must have excellent general business sense and understanding of manufacturing, accounting, purchasing, inventory systems, good communication skills. College degree in business or data processing a plus. If you are looking for a position where your contributions are recognized and you can grow with our business, send resume and salary history to:

FM Ag Products, Inc.
P.O. Box 1230
Cedar Rapids, IA 52406-1230
EOE

Consultant Staffing

CSC

Contact: Don Wells (704) 366-1000 CORPORATE STAFFING

P.O. Box 221730 Charlotte, NC 28222-1730 (704) 366-0070 (Fax)

MOBILE COMPUTING

Today's professionals need the ability to take advantage of corporate resources (people, services and information), whether they are in the office or sitting in an airplane at 30,000 feet. Imagine the ability to complete business activities without returning to the office. This is the world of mobile/remote computing. From wireless computing to remote control of a desktop device, mobile/remote computing has become one of the hottest development areas in the internetworking world.

A critical element of Banyan's networking strategy is to deliver the full benefits of the corporate enterprise via seamless remote connectivity. Banyan currently has a wide range of entry to senior-level openings for driven Software Developers. If you have strong Microsoft Windows programming skills, familiarity with TCP/IP and a demonstrated ability to deliver high quality products, Banyan has the right job for you.

We offer excellent salaries and comprehensive benefits. Please send your resume including current salary and requirements, to:
Banyan Systems Inc., Human Resources, 14 Walkup Drive, Westboro, MA 01581; FAX (508) 836-2823. Committed to equal opportunity employment. Principals.

BANYAN®



GROWTH

Wal-Mart the nation's leading retailer with 1994 sales of $83 billion currently operates over 2 000 stores in the U S and international trade areas Planned growth includes the addition of over 150 new stores annually and projected sales of $100 billion by the year 1996

OPPORTUNITY

Due to our continued expansion plans Wal-Mart provides tremendous opportunity for Information Systems professionals seeking stable career opportunities in a high-energy challenging environment Practical experience in retail manufacturing distribution or replenishment is helpful

THE NATURAL STATE

All positions are centralized in Wal-Mart's Corporate Offices located in Bentonville Arkansas near the beautiful Ozark Mountains Beaver Lake and the University of Arkansas In Northwest Arkansas you will discover a lifestyle that combines urban amenities easy commuting and one of the lowest costs of living in the nation It's a wonderful place to raise a family and we ought to know Wal-Mart's corporate family is one of the biggest and best in the nation

We are seeking Applications Programmers Analysts Systems Programmers/Analysts and Communications Engineers with a 4-year degree or equivalent experience plus a minimum of two years work experience in one of the following areas

APPLICATIONS DEVELOPMENT: Requires Unix C or C++ Informix 4GL/SQL

DATABASE ADMINISTRATOR: DBA experience in IMS DB2 Informix On-Line or other RDBMS on Unix and Teradata

POINT OF SALE DEVELOPERS: Requires C Basic and PC experience Unix and 4680 experience is a plus

WORK STATION DEVELOPMENT: Requires Dos/Windows C or C++ Visual Basic - Client Server architecture experience preferred

SYSTEMS PROGRAMMERS: Requires Unix/OS Programming in C Shell Script and Distributed Networks C++ and X Windows or X 400 and X.500 is a plus

COMMUNICATIONS ENGINEERS: Requires TCP/IP Routers LAN troubleshooting and Unix experience Multi-plexors T1/T3 experience is a plus

IBM MAINFRAME: Programming skills in MVP Cobol and B-treive and/or programming skills in Cobol CICS IMS JCL and DB2-PC Workstation experience and/or Unix/C is a plus

DATA ANALYSTS: Performs conceptual and logical data analysis design and modeling using I E methodology

SYSTEMS ENGINEERS: Requires experience with multiple Novell Servers operating 3 1 and 4 x versions Experience should include Novell NFS TCP/IP and IPX/SPX experience

If you are willing to relocate to beautiful Northwest Arkansas to begin a dynamic career with Wal-Mart send your resume with salary history to

WAL★MART
An Equal Opportunity Employer

Wal-Mart Home Office
Information Systems Division Recruiting
702 SW 8th Street, Bentonville, AR 72716
501-273-6879 FAX

Programmer to design program in C SQL ACCELL UNIFY and modify TPF iTotal Package Fielding TACOM Defence government application and prepare reports using ACCELL report generator write XENIX shell scripts using AWK and SED UNIX utilities maintain an inventory control system using Paradox upload download data on Modem from different sites perform system administration work for the smooth operation of Sequent NCR Tower and Novell DOS LAN identify hardware problems if any and solve them or send them out for repair to receive back in timely manner provide hardware and software training perform statistical analysis on government data using SPSS prepare reports/charts and discuss them with program manager and help the program manager in writing new technical information related to computer hardware software for the new contract proposal Require Masters in Comp Science and 1 yr 6 mos exp as a Programmer 1 yr of exp must include maintaining inventory control system database in Paradox and programming code in C on NCR operating in XENIX 6 mos of exp must include programming in SPSS Exp may have been gained concurrently Masters coursework must include Software Eng Database Mngmt Sys Distributed Database Mngmt Sys and Networking and Parallel Processing 40 hr wk 9am-5pm $37 000 yr Send resume to 7310 Woodward Ave Room 415 Detroit MI 48202 Reference No 33295 Employer Paid Ad

---

Florida
AS/400 P/R's
RPG-400, Sublfile, EDI or JDEdwards
MAINFRAME P/R's
COBOL2, CICS, DB2 or IDMS
SYSTEM SUPPORT/ADMINISTRATION
HP/UX-ACE
CLIENT SERVER
POWERBUILDER, C, C++, ORACLE
Packages:
Vantage • Pacbase • Life 70
CPI/Mortgage/Banking
MEMBER NCA and NACCB
RICHARD RITA
813-289-3000
Fax 813-289-9173
2502 Rocky Point Dr. Suite 800, Tampa, FL 33607

INFORMATION INDUSTRIES INC.

Has immediate (SAP) FULL-TIME/CONTRACT CONSULTANT openings with our firm in the southwest US

R2 & R3
SYSTEMS ANALYSTS
ABAP/4 PROGRAMMERS
ALL MODULES

Excellent compensation, benefits, relocation.
FAX resume to
713-861-5935
or call
713-861-9797 Triple-I

TANDEM
COBOL, PATHWAY,TAL, SCOBOL,C, SQL,X 25

STRATUS
PL1 COBOL,C ON/2

MUMPS UNIX
SUN, HP, RS/6000, GUI, SDK Powerbuilder, C++, Visual Basic Fulltime/Consulting Positions available in the US/ABROAD

STRATEM
800-582-JOBS
TEL (212)967-2910
FAX (212)967-4205
124 W 30th St. Suite #302
New York, N Y 10001

Applications Programmer (Houston, TX area client site) Design, develop, code, test, maintain, and document financial and commercial applications systems, using COBOL, CICS, and DB2 on IBM mainframes. Bachelor's degree in Comp. Sci., Math, Engineering, or Business Admin. and 2 yr. exp. in job req. 40 hrs/wk, 8:30-5, $36,861/yr. Apply at the Texas Employment Commission, Houston, TX, or send resume to the Texas Employment Commission, TEC Building, Austin, TX 78778, J.O. #TX7211782. Ad Paid by an Equal Opportunity Employer

---

ARE YOU MAKING WHAT YOU'RE WORTH?

In only its second year, Computer Systems Authority has grown dramatically because of our unique compensation structure and quality consultants. Our formula for success is simple:

Attract the best people...
Provide strong incentives for performance...
Handle the administrative details...
Get out of the way...

Constructed on a new business model, CSA is designed to provide you with the partnering support to be successful. The focus is to provide unlimited income opportunities for you by maximizing traditional corporate overhead and time billing rate will come directly to you. Most consultants make in excess of $100,000 year.

At CSA we are looking for consultants who have an entrepreneurial attitude, a strong work ethic, desirable marketable skills and strong principles. Whether you are employed or work as an independent, you should consider the opportunities available through CSA Consulting. Please fax resumes to 214-347-9047 or e-mail at admin@csa.com

C S A Computer Systems Authority
Consulting

SYSTEMS ANALYST required Design coding & analysis of systems software on IBM AS/400 platforms using expertise with RPG-400 COBOL SQL & CLP Analyze client requirements & customize software using BPCS & AS/400 operating system utilities Pathfinder PDM & SDA Migrate data & applications from other platforms to AS/400 using knowledge of IBM Systems 36 & 38 UNIX Operating system platforms ASNA compilers & SNADS communication protocols Bachelors Degree or its Equivalent required in computer intensive curriculum plus 4 years experience in the job duties described above Must have proof of legal authority to work in the U S Salary $42 000 year for a 40 hour work week Send resume to Job Service of Florida 401 SW 27th Ave Room 47 Miami FL 33135-3014 Refer to Job Order number FL-1187591

TANDEM

Our Dynamic Development company is seeking Professional Programmers.

Immediate placement for Contract and Full-Time Individuals. EOE

Terron Lindholme
Metro Network, Inc
111 Center St Suite #1949
Little Rock, AR 72201
800 2-METRO-4
501 372-7863 Fax

CONTRACTING **BANKING** **PERMANENT**

Programmers/ Business Analysts

- HOGAN
- SYSTEMATICS
- GENERAL BANKING
- CLIENT SERVER

PRO Inc. a National Search Firm has **CONTRACTING & PERMANENT** opportunities - domestic & international Confidential contact 800-748-6474 Fax resume 619-587-2090, 9191 Towne Centre Dr., Suite 102, San Diego, CA 92122

Conference Call

1995
CORPORATE TECHNICAL RECRUITING CONFERENCE
COMPUTERWORLD

Computerworld's Corporate Technical Recruiting Conference

Suburban Denver, Colorado

June 11-14, 1995

For more information, call
1-800-488-9204

*Clip and FAX this coupon to **1-508-620-9430** or call **1-800-488-9204** for more information*

Please place my name on your mailing list so I'll receive registration materials and information throughout the year.

Name _____
Title _____
Company _____
Address _____
City _____
State _____ Zip Code _____
Phone _____
Fax _____
e-mail _____

CTRC

Midwest

Mapping The Future of a Wireless World



As the 7th largest cellular service provider in the nation, United States Cellular Corporation has the experience and the ingenuity to remain in the forefront of the competitive telecommunications industry. We're a respected $300 million leader providing service to 120+ markets. We invite you to join the accomplished systems team in our Chicago headquarters as we revolutionize the future of wireless technology.

PROGRAMMER/ SYSTEMS ANALYSTS

Involves developing and enhancing decision support systems, business applications, imaging and network planning applications. PROGRAMMER ANALYSTS - Requires 2-4+ years coding experience in the following technical environment: UNIX/AIX, ORACLE, SQL, Forms 4.0 and C in an RS6000 environment -OR- COBOL, JCL, TSO, and ISPF in an MVS/ESA environment. ORACLE/SQL a plus. SYSTEMS ANALYSTS - Requires 5+ years of systems development experience performing and/or leading projects in the technical environment as described above. Cellular or telephony experience is a plus.

STRATEGIC SYSTEMS PLANNING

Systems Analysts to perform product evaluation, selection, integration/implementation, planning and architectural systems design. Cellular or telephony experience a plus.

We offer a competitive salary and benefits. For consideration, please forward/fax a resume (indicate position of interest and include salary history/ requirements), to: **UNITED STATES CELLULAR CORPORATION, 8410 W. Bryn Mawr, Suite 700, Chicago, IL 60631. FAX: (312) 864-3198.** Equal Opportunity Employer, M/F/D/V.

UNITED STATES CELLULAR
MOBILE TELEPHONE NETWORK

DATA PROCESSING & ENGINEERING CAREER FAIR 2/27-28

Michigan Technical Recruiters' Network seeks professionals for a variety of DP/Eng positions. Meet with the key decision makers of these companies and more:

ANALYSTS INTERNATIONAL CORP	DETROIT MEDICAL CENTER
ANALYTICAL TECHNOLOGIES	EDS
ANDERSON CONSULTING	INTERACTIVE BUSINESS SYSTEMS
BARTECH	JAWOOD MANAGEMENT
CAP GEMINI AMERICA	MICHIGAN PEER REVIEW ORG
COMPREHENSIVE DATA PROC	RST
COMPUTER & ENGINEERING SVC	SOFTWARE SERVICES
COMPUTER HORIZONS CORP	SOURCE CONSULTING
COMPUTER TASK GROUP	SYNTEL
COMPUTER TRAINING & SUPPORT CORP	TECHNALYSIS
COOPERS & LYBRAND LLP	TECHNICAL ENGINEERING CONS
DECISION CONSULTANTS INC	

February 27: 2 pm-7 pm Embassy Suites Hotel, Livonia
February 28: 11 am-7 pm Management Education Ctr, Troy

College degree/minimum 2 years' experience preferred. DP – all software languages/hardware platforms/operating systems; Product Mgrs; App. Product Mgrs; Client-Server; COBOL, Powerbuilder. Engineering – all areas, CAD Designers, Techs, Mech. For info call 313.882.2277 or if unable to attend, fax resume to Maureen, hi communications, 313.882.3626.

supported by COMPUTERWORLD

MARKETING AND MEDIA RELATIONS MANAGER.....

Association management firm seeks marketing communications manager with 5+ years experience in marketing/media relations/public relations position in our Chicago office.

Strong marketing background in business arena. Computer technology and working with senior management or volunteer leaders a strong plus. Demonstrated successes in agency/corporate positions. Adept at integrating marketing with communications and media relations.

Excellent writing skills with strong knowledge of print communications, direct mail, image building and conference marketing. Must like to work with multiple projects. Hands-on management style with experience working in a team environment.

Excellent opportunity for creative hard worker. We offer excellent benefits, including medical, dental, profit sharing and 401K. Please send resume including salary history to: **Mary McMahon, Smith, Bucklin & Associates, 401 North Michigan Avenue, Chicago, IL 60611. PHONE 312/644-6610 FAX 312/321-6869**

CONSULTANTS

There is high demand for your skills and expertise among companies in the Information Technology Industry. You want to make the right career move, yet sometimes it's hard to sort out the hype from reality.

LISTEN to what some of METRO's 1,000 Staff Members said about their Company on a Company-wide Staff Survey conducted last fall. Then, call the Professional Staff Recruiter in the location of your choice to discuss your opportunities.

WHAT IS THE MOST POSITIVE ASPECT OF METRO?

"Great Company. Very supportive and people-oriented. The Staff is the best. Not just good, but extremely good."

"Working with other Consultants who have a professional approach to their work and take pride in doing the job right."

"Opportunity for personal and professional growth and financial gain. Metro provides a unique combination of responsibility and freedom."

"Being part of a fast growing, dependable Company."

"The ability to further my education and use the skills acquired."

"The benefits package is excellent."

If you are interested in multiple locations or are qualified for a number of opportunities:

Call Kim 800-849-8406 (Ext. 136)
Fax 804-486-0816 (Dept. 195C)
EOE

METRO
Information Services

CICS, DB2, IDMS, IMS DB/DC, AFS, ADS/O
Atlanta, Charlotte, Dallas, Ft. Lauderdale, Greensboro, Houston, Jacksonville, Nashville, Raleigh, Richmond, Roanoke, San Juan, Tampa, Virginia Beach

C++, OS/2, MS Windows or Windows NT
Atlanta, Charlotte, Dallas, Ft. Lauderdale, Greensboro, Houston, Jacksonville, Nashville, Raleigh, Tampa

Visual Basic, Visual C++
Atlanta, Ft. Lauderdale, Jacksonville, Nashville, Raleigh, Tampa, Virginia Beach

C, UNIX, Oracle, SQL
Atlanta, Charlotte, Dallas, Ft. Lauderdale, Greensboro, Houston, Jacksonville, Nashville, Raleigh, Tampa

Oracle, DBA, SQL*Forms 4.0, DB/2
Atlanta, Charlotte, Ft. Lauderdale, Jacksonville, Raleigh, Richmond, Tampa

Peoplesoft
Atlanta, Greensboro, Nashville, Raleigh, Richmond

PowerBuilder, Sybase, SQL Server NT
Atlanta, Charlotte, Dallas, Ft. Lauderdale, Greensboro, Houston, Jacksonville, Nashville, Raleigh, Richmond, Tampa, Winston-Salem

ADABAS / NATURAL
Atlanta, Charlotte, Greensboro, Richmond, Winston-Salem

Microfocus COBOL, AFS, PC
Charlotte, Jacksonville, Richmond, Tampa

SAP/ABAP
Greensboro, Houston, Nashville, Richmond, Virginia Beach

FoxPro, Clipper
Dallas, Raleigh, Richmond, Virginia Beach

Smalltalk
Charlotte, Dallas, Ft. Lauderdale, Greensboro, Nashville, Raleigh, Virginia Beach

Special Requirements
ASI-ORP Package (Greensboro, Winston-Salem)
AS/400 RPG/400, PRISM (Ft. Lauderdale, Greensboro, Winston-Salem)
Banking, DB2 (San Juan)
Business Analysts with Client Server Background, Mainframe Programmers and HOGAN (Atlanta, Charlotte, Dallas)
C++, OOPS, VMS (Winston-Salem)
C, UNIX, AIX Systems Administrators (Atlanta, Dallas)
CICS, COBOL, DB2 (Greensboro, Roanoke, Winston-Salem)
LAN/WAN Network Engineer, Novell, Unix, Routers, Host Connectivity (Va Beach)
M & D, Millennium (Atlanta)
Macintosh C, C++, Oracle (Raleigh)
Magic Programmer Analyst (Virginia Beach)
Natural, DB2 (Winston-Salem)
OMNIS 7 (Raleigh)
SGML/HTML Developers (Virginia Beach)
SHERPA (Dallas)
Sun UNIX (OS/2 and Solaris) LAN Administrators (Dallas, Raleigh)
Tesseract (Richmond)
Windows NT/AS Systems Engineers (Dallas)

Atlanta, GA	800-486-5302	Nashville, TN	800-486-5308
Fax	404-843-5930	Fax	615-373-6004
Charlotte, NC	800-486-5291	Orlando, FL	800-486-5286
Fax	704-529-6116	Fax	813-286-1017
Dallas/Ft. Worth, TX	800-486-5287	Raleigh, NC	800-486-5289
Fax	214-490-4681	Fax	919-785-9305
Ft. Lauderdale, FL	800-486-5305	Richmond, VA	800-486-5290
Fax	305-476-9729	Fax	804-285-7695
Greensboro, NC	800-486-5296	Roanoke, VA	800-486-5294
Fax	910-665-1844	Fax	910-665-1844
Greenville, SC	800-486-5291	San Juan, PR	800-486-5305
Fax	803-297-6799	Fax	809-736-0967
Houston, TX	800-486-5063	Tampa, FL	800-486-5286
Fax	713-871-8967	Fax	813-286-1017
Jacksonville, FL	800-825-1319	Virginia Beach, VA	800-486-5285
Fax	904-281-1040	Fax	804-431-8215
Miami, FL	800-486-5305	Winston-Salem, NC	800-486-5294
Fax	305-476-9729	Fax	910-665-1844

FLORIDA

Permanent and contract opportunities.

ORACLE, FORMS, SQL
AS400, RPG 3/400, ACCT
CASE IEF, PACBASE
C/S Development
C, C++, UNIX, R/T
C, M/11 & MOTIF, UNIX, Graphics
DBA, SQL, S/W IF, UNIX
Signal Proc, R/T, UNIX, C
ATM or Frame Relay, C

HAIL, Inc.
4890 W. Kennedy Blvd. #300
Tampa, FL 33609-1857
Call 813/282-8336
Fax 813/282-4990
Internet hailcareer@cmix.com

FLORIDA - 80 DEGREES!

PERMANENT & CONTRACT

DB2, IDMS or IMS P/A's	to $56K
AS/400 P/A's	to $52K
HP 3000/9000 P/A's	to $58K
FOCUS (or) RDB P/A's	to $54K
SYBASE (or) ORACLE	to $62K
OCS (or) MSA P/A's	to $53K
SAP SOFTWARE P/A's	to $$$$

For immediate consideration call EDI or FAX your resume to (305) 963-4333.

EDI SYSTEMS
450 N. Park Road #320
Hollywood, FL 33021
(305) 962-9444
email: edifla@aol.com

TECHNICAL JOB FAIR

Sponsored by Minnesota Technical Recruiters Network

FEB. 28 - MARCH 1
3pm to 8pm both days
Minneapolis Convention Center - Free Admission

WHO SHOULD ATTEND:

ENGINEERS from all areas including – chemical, electrical, mechanical, software, civil, manufacturing, test, quality, process control, industrial, environmental and many more.

COMPUTER DP/MIS PROFESSIONALS with experience in all of the following areas:

DBA/DBP: Client/Server, UNIX, MS, UNIX, DB2, Sybase, Server, Omni Server, ORACLE, SQL, FOCUS, Data Modeling, Oracle, and more.

DBA/WINDOWS: Client Server, Sybase, Open Client/DB-LIB, Omni Server, Gateway, PowerBuilder, C/C++, and more.

SALES: Client/Server, Sybase, Open Client/DB-LIB, Omni Server, Gateway, C, Project Management, Field Engineering, and more.

Even if you are presently employed, come and find out about the great opportunities available. Bring plenty of copies of your resume.

Stop by the LEARNING & EDUCATION CENTER. Information on advanced educational opportunities and FREE SEMINARS!

If you cannot attend, please fax (612) 395-4099 or mail your resume to PSI, 1809 Plymouth Rd. #350, Minneapolis, MN 55305. We are not an employment agency.

NETWORK/TECHNICAL SERVICES MANAGER

BISSELL, Inc., a [illegible] manufacturer and marketer of quality home care products, has an exciting opportunity available in its Information Systems area.

Working closely with other MIS personnel, this individual will be responsible for the design, implementation, support and management of an [illegible] network. We are looking for a [illegible] with a BS/MS degree in Computer Science, Information Systems or Engineering and [illegible] years' experience in the [illegible] environment. Knowledge of [illegible] is required. This individual will also be responsible for the [illegible] of [illegible] and [illegible] skills. Knowledge and [illegible] of [illegible] and [illegible] as well as [illegible] are [illegible] skills. Knowledge of [illegible] is also preferred.

We offer a competitive compensation package including [illegible] and [illegible]. Please send resume or [illegible] to: Human Resources, BISSELL, Inc., [illegible], Grand Rapids, MI 49501. Equal Opportunity Employer.

BISSELL

Midwest

QUALITY IS OUR FOUNDATION...
EXCELLENCE IS OUR REPUTATION

SPECTRUM TECHNOLOGY GROUP, INC. has been assisting clients with advanced expertise in information technology planning, integration and project implementation since 1979. The foundation for our quality reputation is a group of dedicated people -- IS professionals who take pride in their work, enjoy the diversity of consulting challenges and are eager to contribute to our mutual growth.

At Spectrum we've created a corporate culture that encourages the exchange of ideas and promotes internal networking through monthly dinner meetings, in-house classes and a variety of social activities. At Spectrum, you'll have ample opportunity to develop the vision, technical skills and business savvy to meet all of your career objectives.

INFORMATION ARCHITECTURE CONSULTANTS

Industry trends such as business process re-engineering, data warehouse, and client/server computing are causing increasing demand for Spectrum consultants to serve as Data and Information Technology Architects and Enterprise Modelers.

Barbara von Halle, Spectrum Principal, author, and respected Information Management Consultant, is leading Spectrum's initiative in emerging areas including business rule theory and tools, and the effective use of Object Orientation. We are seeking experienced professionals to contribute to our growing reputation, and participate in understanding and applying important industry trends to business opportunities.

We have immediate opportunities for candidates who possess expertise in Enterprise Modeling, Data Modeling and Data Warehouse Planning and Implementation. Successful candidates will be full-time employees of Spectrum and will receive full benefits and a competitive salary. Opportunities exist along the East Coast including New Jersey, South Florida, and Atlanta, Georgia.

Call (908) 725-4000 today.

You may also fax your resume and salary requirements to (908) 725-9313 or mail them to: Spectrum Technology Group, Inc., Attn: Suzanne Morgan, 3421 U.S. Highway 22, Somerville, NJ 08876. EOE M/F/D/V.

SPECTRUM
Technology Group, Inc.
Spectrum People- The Paradigm For Excellence

SOFTWARE ENGINEER Job duty incl Program in Microsoft Visual C/C++ using object oriented multi platform development tools to maintain & enhance state-of-the-art search & retrieval software to access database stored on CD-ROM use Novell Netware API to support network functionality to various medical information CD-ROM products format & process data from various sources & formats to establish database for search & retrieval via proprietary search engine use CD ROM tech to format test & produce information searchable & retrieval CD ROM products incl error detect & problem solving, use DBMS tools in UNIX incl Oracle PRO'C embed SQL & C program on HP series 9000 Comp use HP UX provide tech support to various CD ROM product clients, create applications using photo compression codes to drive comp generated print product program in C on IBM RS/6000 running AIX create applications, maintain & enhance existing applications & software port C application from Microsoft Visual C/C++ en DOS sys to HP UX & AIX operate sys, from HP UX to AIX sys according to difference in hardware, operate sys & compilers; write C programs to compress & decompress images & graphics to minimize storage space required to be displayed on DOS & Windows Platforms, incl bit to bit transformation & compression of images & manipulate various structures to decompress images for displaying, add update function for CD ROM software products per user requests, & use Authology Multimedia authoring sys to author DVI based multimedia applications. Reqmts: B.A in Comp Sci 5 mo exp in job offered or M Comp Lab Assistant, programmed relational database sys using SQL programmed a large database sys using CD ROM tech programmed using Authology Multimedia authoring sys, 5 mo exp in Object Oriented Programming with class libraries Course work incl Client/Server Application Development Object Oriented Modeling and Database Design GUI Design and Formal Methods for Software Maintenance & Program Debug 40 hr/wk 8am-4:30pm $38,665/yr, must have proof of legal authority to work permanently in the U.S. Send 2 copies of resumes to: IL Dept of Employment Security, 401 South St 3S, Chicago, IL 60605, Attn: Mary Miles Ref ev IL 11773-M no calls an employer paid ad.

Software Engineer to develop Graphical User Interface (GUI) for analysis software developed in-house for various analysis applications across the auto industry such as plotting modeling & suspensions analysis using C/C++ X Windows & Motif toolkit & SGI HP & SUN Workstations in a TCP/IP communication protocol based network environment Reqs M S in Comp Sci & 6 mos related exp in job offered or 4 mos related exp as Software Engineer, Programmer Analyst, Systems Analyst, Programmer or Consultant Related exp must include X-Windows/OSF Motif based GUI development & analysis also using TCP/IP C/C++ & UNIX Must have 1 grad level course each in Design & Analysis of Algorithms Operating System Design, Object Oriented Programming & Database Management System Theory. $3,200/mo 40 hrs/wk Biz Sp Send resume to 7310 Woodward Ave Room 415 Detroit, MI 48202 Ref #26395 "Employer Paid Ad"

Programmer/Analyst (Consultant) Apply knowledge of computer s/w & h/w to implement financial & other operational support systems based on client/server arch in a variety of industries using rel d/b s/w C & C++ prgrmming, 4GL app dev tools & off-the-shelf apps. s/w Develop integration & acceptance test plans, specify reqs transform reqs into detailed designs & implement Train users. Must have BSCS/EE & 2 yrs exp dev client/server systems using rel d/b Must have coursework or equiv exp in GUI, comp arch, networks, op sys, oop & prgrmming Must have prgrmming knowledge of UNIX & at least 2 other op sys & must know communications & NOS's Frequent travel 3 positions available $3167/mo Home office/interview site in Chicago Resume to CW-146203, Computerworld, Box 9171, Framingham, MA 01701-9171

Programmer/Analyst (Plano, TX) Analysis, design & programming of computerized order fulfillment & invoice system in IBM (MVS/ESA) mainframe & PC environments in COBOL, COBOL II and DB2/SQL, incorporating JACKSON structured programming & design techniques. Two yrs. exp. in job offered $36,500./Yr. Mon-Fri, 9-5 (40 hrs/wk.) Apply at the Texas Employment Commission, Dallas, Texas, or send resume to 1117 Trinity, Room 424T, Austin, Texas 78701. JO#0928625 Ad paid by an Equal Opportunity Employer.

How to find the Midwest's top computer talent.



New Regional!

1-800-343-6474

America's Fastest Growing Consulting Firm

CAPRICORN SYSTEMS INCORPORATED

Quality is not an accident. It is the combination of knowledge, hard work, and commitment. CSI's approach to quality has enabled it to become one of the fastest growing consulting companies with 300% annual growth. We invite you to become part of this exciting growth by contacting one of our offices in Atlanta, D.C., San Francisco, or Dallas.

Immediate openings nationwide:

- Oracle/PowerBuilder
- Oracle DBA
- Oracle/Visual Basic
- Oracle 7.0/Forms 4.0
- Sybase/PowerBuilder
- Sybase DBA
- Sybase C++
- ingres
- DB2/CICS/ADW
- VAN RDB DBA
- AS/400/RPG/Cobol
- C++/Visual Basic
- MS Windows SDC
- System Architects
- Transformer Pro Plus
- Tandem Network Analysts
- Cellular Billing
- Spectrum BU
- Cardbox
- D&B Manufacturing
- Ross HP/3000
- PeopleSoft
- Oracle Financials

Capricorn offers exceptional career opportunities, medical insurance, 401K plan, paid vacations, and relocation assistance.

Mail/Fax resumes to:
7 Dunwoody Park, Suite #109, Atlanta, GA 30338
(404) 399-6788, FAX (404) 396-7768

DC (703) 749-1488, FAX (703) 749-1477
SFO (415) 332-0700, FAX (415) 332-0701
DALLAS (214) 699-8366, FAX (214) 699-8230

Senior Systems Engineer to design and develop full scale client/server software application for usage in multiple hardware and software platforms including database, GUI, operating system, network, and language elements for the home health care industry utilizing applications development for X Windows, Macintosh and Microsoft Windows GUIs, and porting applications between different hardware platforms and GUI engines: Sybase and ORACLE databases, TCP/IP networks; C language; and hardware including SUN Microsystems and Hewlett Packard. Macintosh. Requires M.S. or equivalent degree in Computer Science, Math, MIS, Computer Engineering or closely related field, 1 year experience in systems design, development and implementation within client/server technology, and thorough proficiency in applications development for X Windows, Macintosh and Microsoft Windows GUIs, and porting applications between different hardware platforms and GUI engines: Sybase and ORACLE databases, TCP/IP networks, C language, and hardware including SUN Microsystems and Hewlett Packard and Macintosh. Candidates must be presently eligible for permanent employment in U.S.A. Salary $50,000/year 40 hour week, bonus eligibility based on performance, employee benefit plan. Position is with computer software development firm in Overland Park, KS. Please apply with resume and details of experience and proficiencies in person to your local Kansas Job Service or send resume to: Human Resources, KS0795713, Attn: S.M. Barnett, P.O. Box 778, Chanute, KS 66720-0778. An Employee Paid Ad. EOE

Computer Systems Analyst Design networked & stand-alone IBM PC & workstation compatible computer systems including system requirements layout & procedures. Develop new system specifications & flow charts. Analyzes & assists in implementation of new systems & custom orders including LANs & WANs. Design, develop, write & debug custom applications for customers including programmable relational database systems. Extensive consulting & technical liaison services provided to customers. Languages & Operating Systems used include C, FORTRAN & Assembly DOS & Unix. 40 hrs/wk, 9am-5pm. Salary $42,850/yr. Requires Bachelors degree in Computer Science & 2 yrs experience in job offered or 2 yrs as Computer Programmer. Other special requirements include Experience to include use of Languages & Operating Systems listed above, design & installation of LANs & WANs, & programmable relational databases. Will accept Bachelor's degree in combination of Computer Science & Mathematics in lieu of degree only in Computer Science. Must have proof of legal authority to work permanently in the U.S. Send TWO copies of resume to: Illinois Department of Employment Security, 401 South State St., 3 South, Chicago, IL 60605. Attn: Leonard Bokas. Ref #V IL 12482 B. NO CALLS. AN EMPLOYER PAID AD

Software Engineer 40 hrs./wk., 8 am - 5pm, $40,659/yr. Job requires Master's degree in Computer Science and 2 yrs. experience in job. Offered at Programmer Analyst. Job also reqs. 1) Exp. must include exp. designing & developing Order Processing & Warehouse Management Systems. 2) Exp. must include exp. in UNIX system administration including the installation of PC software & hardware. 3) Exp. must include exp. designing & developing business applications using COBOL & Relational Database Management System applications. 4) 2 graduate courses in database management systems & 5) 1 grad. crse. in software development. Special requirements 1), 2) & 3) may be met concurrently during the same 2 yr. period job duties. Design & develop Order Processing & Warehouse Management Systems. Perform system administration duties & provide technical assistance to users. Install PC hardware & software. Generate ad hoc reports in response to user requests. Supervise data entry operators. Qualified applicants should send resume & verification of reqs. to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. #24395. Employer Paid Ad.

SOUTHEAST

Work and play in one of the most desirable areas:

beaches • mountains lower cost of living year-round golf • lakes

- Client Server
- Mainframe
- Networking

ACP

Salaried•Full Benefits•401(k) Referral $

American Computer Professionals, Inc.
P.O. Box 11188
Columbia, SC 29211
800-833-8227
Fax: (803) 779-1966
(803) 256-3222
Internet: ACP@SCSN.NET
equal opportunity employer

CONSULTANT Design, analyze, develop, implement, and test software systems for windows using Visual Basic (3.0), MS Access (2.0), Oracle (7.0), C Unix, and MS Windows. Utilize tools, features, controls, and techniques such as DDE, OLE, MDI Form, True Grid, Tab control, Data control for Screens, Crystal Report Writer and Access Report Writer for Reports, MS Excel for Macros and Charts, MS Delta for Version Control, SqlPlus, SqlNet, O+E Oracle 7 ODBC Drivers to communicate with Oracle from Visual Basic application, Triggers and stored procedures to maintain Database integrity, C for DLLs. Write user documentation, install, and give user training for the developed applications. Req'd: MS in Computer Science or Electronic Engineering with 2 year exp. in the job offered or 2 year exp. in a related occupation such as Programmer Analyst/Software Analyst. Related experience must include system design and development using VISUAL BASIC 3.0, MS ACCESS 2.0 and ORACLE RDBMS. Must also have some related experience using C, UNIX and SQL*PLUS. 40 hrs./wk., 8:00 am - 5:00 pm, $53,000 per year. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. #31585. "Employer Paid Ad."

MANUFACTURING PROJECT ENGINEER Design of manufacturing process of tooling and equipment for manufacturing. Design process improvement for manufacturing. Evaluate and recommend proposals, forecast effective automation solutions. Support product engineering through the product launch cycle. Design, develop and trouble shoot for equipment automotive controls. Support estimator with product quotes. Train technicians on use of CNC machines. Evaluate and recommend tooling and equipment suppliers. Req'd: M.S. in Industrial Engineering with 6 months exp. in the job offered or 6 months exp. in a related occupation such as Management Trainee. Academic background must include graduate level courses one each in Design/Engineering Experiments, Analysis, Decision Process, Math Tools/Industrial Engineering Advanced, Factory Planning, Database Concepts for Industrial Management Systems. Related experience in the area of SPC procedures, CNC machines and PLC. 40 hrs/wk, 8:00 am - 5:00 pm, $40,280 per year. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. #33495. "Employer Paid Ad."

Where do the best computer professionals look for jobs?

Right here.

In fact, more computer pros read more computer recruitment advertising in *Computerworld* than in any other newspaper.

Talk to the best.

Place your advertisement in *Computerworld*.

For more information or to place your ad regionally or nationally, call

Lisa McGrath at 800-343-6474; x 201 (in MA, 508-879-0700).

Weekly
Regional
National
And it works

COMPUTERWORLD

IE IEF

CASE Masters is searching for consultants to fill assignments in the Southeast and Midwest. We're interested in you if you have been practicing IE/IEF full life cycle skills for at least 2 years and excel in project facilitation, data and process modeling, encyclopedia management or business system implementation.

We are a respected leader in IE project engagements and are a TI Alliance Partner.

CASE Masters, Inc.
3257 Pomarius Lane, Norcross GA 30092
FAX (404) 441-3372

Midwest

ANOTHER REASON WHY COMPUTERWORLD RECRUITMENT ADVERTISING WORKS ...

For over two decades, Computerworld has delivered qualified job candidates to America's employers.

And ever since Computerworld's first weekly issue in 1967, America's companies have relied on *Computerworld* to target America's most qualified computer job candidates.

To place your ad regionally or nationally, call John Corrigan, Vice President Recruitment Advertising, at 1-800-343-6474; x 201 (in MA, 508/879-0700).

COMPUTERWORLD

PRIMERICA Financial Services

Due to our tremendous growth Primerica Life Insurance Company, a member of Travelers Group, and a leader in the Financial Services Industry, is expanding our Information Systems Department. We have immediate career opportunities for several Data Processing professionals in each of the following areas:

PROGRAMMER ANALYST II SECURITIES/FINANCIAL PROGRAMMING

- Candidates must have 3+ years programming experience with IBM mainframe TSO/MVS environment, COBOL, command-level CICS, VSAM.
- DB2 or other SQL experience preferred.
- Financial services experience is preferred.
- Excellent communication skills are required.

PROGRAMMER ANALYST II – INSURANCE PROGRAMMING

- Candidates must have 3+ years experience in IBM mainframe Assembler programming.
- Experience with COBOL, DB2 and Command Level CICS experience a plus.
- LIFE 70 or any Life Administration System experience desirable.

PC PROGRAMMER ANALYSTS

- Requires experience in GUI development for Windows.
- Knowledge of object oriented design/programming desirable and financial services application a plus.
- Ability to coach others and transfer skills to team members preferred.
- SQL/relational database skills a plus.

We offer a competitive salary with an excellent benefits package to include medical, dental, 401(k), retirement, etc. Send resume including salary history to:

PRIMERICA
Financial Services
Corporate Employment Center
3120 Breckinridge Boulevard
Duluth, GA 30199
TDD: (404) 564-7960
(No Agencies Please)

A Member of *TravelersGroup*

Martin Marietta Technical Services, Inc. in Research Triangle Park North Carolina in support of the Environmental Protection Agency has several key openings. If you have applicable experience a four year degree and excellent communications skills apply now for immediate consideration.



Novell Network Engineer

We seek a professional with six or more years of experience installing and troubleshooting LAN/WAN with proficiency in Token Ring LANs and protocol analyzers. Key skills include Netware 3.x and 4.x, TCP/IP IPX, MS-DOS OS/2, Appletalk, Windows, Lotus Notes, WordPerfect Office, file and print servers routers and LANWorkGroup. Candidate will be a member of our Systems Support Team to provide hotline resolution to problems, hands-on and remote troubleshooting, software testing and driver upgrades, and installing/configuring servers and other LAN hardware

ORACLE Applications Programmer Analyst

An ideal candidate will have five or more years experience in scientific applications work in a UNIX environment with one or more years experience supporting client/server computing. Knowledge of PC DEC Alpha OSF/1, Sun, and DG platforms required as are skills in ORACLE (Forms, Reports, SQL, Browser Book) X Windows Internet tool DEC Pathworks Novell LAN Workgroup for DOS, Wordperfect ARC/INFO, ArcView, and SAS. The position provides customer support software testing, and Internet services for a nationwide distributed client/server application using ORACLE databases.

Please forward your resume, indicating the desired position, to Martin Marietta, Attn: Don Rogers, HR, P.O. Box 14365, RTP, NC 27709 or FAX to (919) 541-8930.

Only qualified candidates need apply no entry level positions are currently available. Martin Marietta provides a FLEXIBLE Benefits Program competitive salaries cost sharing, and a challenging, professional work environment EOE

SYSTEMS ANALYST

We're a Best A+ rated life insurer with 7.3 billion in assets, headquartered in Vermont ski country, seeking a highly motivated individual to analyze, design, code, test and maintain mainframe, PC LAN and client/server programs.

Qualified candidates will have three to six years of experience in mainframe and two to three years in micro systems and client/server development. Proven project management and full life cycle development skills are required

Successful candidates will also possess strong communications and interpersonal skills and a working knowledge of data management, major project team interaction and development methodologies. Basic knowledge of finance, insurance, annuities, and actuarial science is desirable, as is experience in COBOL, Windows, DB2, Microfocus COBOL, Data Ease, PowerBuilder and client/server products.

We offer an excellent working and living environment with a comprehensive benefits package, including relocation. Salary is commensurate with qualifications

Please send resume and salary history to Nancy Tripp, National Life of Vermont, Montpelier, Vermont 05604.

National Life of Vermont

Information Management Resources, Inc. (IMR) is a fast growing international commercial systems integration software development and consulting company dedicated to helping businesses maximize their information system potential through innovative and creative software solutions. Our recent growth and new business opportunities have created the following immediate requirements

Vice President Professional Resources

Based in Clearwater, Florida this is a senior management position responsible for planning, managing, sourcing, recruiting, and coordinating all professional resources related activities at a national level. Also responsible for regional recruiting through regional recruitment managers. Candidates must be seasoned recruiters in the information technology business with solid management skills.

Regional Recruitment Manager-Chicago

Reporting to the Vice President Professional Resources, this individual will be responsible for all recruitment and sourcing activities for the Midwest region. Must have solid prior track record of recruiting for a national systems consulting company in the Information Technology industry

Sales Representative-Chicago

Reporting to the Regional Vice President Sales-Midwest Region, this individual will be responsible for marketing IMR software development software maintenance, migration/conversion and systems consulting services to the Midwest region. Candidates must have at least 3-5 years sales experience and proven track record of selling systems-related services with a local or national company

Project Managers/Senior Consultants/Senior Programmers/Programmers

We require professionals at all levels, for our U.S. offices with the following technical disciplines

OS/2, PM, C	IEF 5.X
SAP R/2, R/3	MVS, CICS, DB2, COBOL, IMS
ORACLE 7, SYBASE	UNIX, C, C++, OOP, OOA, OOD
POWERBUILDER, VISUAL BASIC	SMALLTALK, VISUAL WORKS

IMR offers excellent compensation and a comprehensive benefits package. Interested candidates who are available immediately and willing to relocate should apply by mailing or faxing a detailed resume, including the reference and a contact telephone number to:

Information Management Resources

Donna M. Kapinos
Reference No. CW0295
Information Management Resources, Inc.
26750 U.S. Highway 19 North
Suite 500
Clearwater, FL 34621-3442
Tel: (813) 797-7000/Fax: (813) 791-8152
Equal Opportunity Employer

CONSULTANTS

There is high demand for your skills and expertise among companies in the Information Technology industry. You want to make the right career move, yet sometimes it's hard to sort out the hype from reality.

LISTEN to what some of METRO's 1,000 Staff Members said about their Company on a Company-wide Staff Survey conducted last fall. Then, call the Professional Staff Recruiter in the location of your choice to discuss your opportunities.

WHAT IS THE MOST POSITIVE ASPECT OF METRO?

"Great Company. Very supportive and people-oriented. The Staff is the best. Not just good, but extremely good."

"Working with other Consultants who have a professional approach to their work and take pride in doing the job right."

"Opportunity for personal and professional growth and financial gain. Metro provides a unique combination of responsibility and freedom."

"Being part of a fast growing, dependable Company."

"The ability to further my education and use the skills acquired."

"The benefits package is excellent."

If you are interested in multiple locations or are qualified for a number of opportunities:

Call Kim 800-849-8406 (Ext. 136)
Fax 804-486-0816 (Dept. 195C)
EOE

METRO
Information Services

CICS, DB2, IDMS, IMS DB/DC, APS, ADS/O
Atlanta, Charlotte, Dallas, Ft. Lauderdale, Greensboro, Houston, Jacksonville, Nashville, Raleigh, Richmond, Roanoke, San Juan, Tampa, Virginia Beach

C++, OS/2, MS-Windows or Windows/NT
Atlanta, Charlotte, Dallas, Ft. Lauderdale, Greensboro, Houston, Jacksonville, Nashville, Raleigh, Tampa

Visual Basic, Visual C++
Atlanta, Ft. Lauderdale, Jacksonville, Nashville, Raleigh, Tampa, Virginia Beach

C, UNIX, Oracle, SQL
Atlanta, Charlotte, Dallas, Ft. Lauderdale, Greensboro, Houston, Jacksonville, Nashville, Raleigh, Richmond, Tampa

Oracle DBA, SQL*Forms/4-D, DB2/2
Atlanta, Charlotte, Ft. Lauderdale, Jacksonville, Raleigh, Richmond, Tampa

Peoplesoft
Atlanta, Greensboro, Nashville, Raleigh, Richmond

PowerBuilder, Sybase, SQL Server/NT
Atlanta, Charlotte, Dallas, Ft. Lauderdale, Greensboro, Houston, Jacksonville, Nashville, Raleigh, Richmond, Tampa, Winston-Salem

ADABAS/NATURAL
Atlanta, Charlotte, Greensboro, Richmond, Winston-Salem

Microfocus COBOL, APS/PC
Charlotte, Jacksonville, Richmond, Tampa

SAP/ABAP
Greensboro, Houston, Nashville, Richmond, Virginia Beach

FoxPro, Clipper
Dallas, Raleigh, Richmond, Virginia Beach

Smalltalk
Charlotte, Dallas, Ft. Lauderdale, Greensboro, Nashville, Raleigh, Virginia Beach

Special Requirements
AS/400 Package (Greensboro, Winston-Salem)
AS/400 RPG/400, PRISM (Ft. Lauderdale, Greensboro, Winston-Salem)
Banking, DB2 (San Juan)
Business Analysts with Client Server Background, Mainframe Programmers and HOGAN (Atlanta, Charlotte, Dallas)
C++, OOPS, VMS (Winston-Salem)
C, UNIX, AIX Systems Administrators (Atlanta, Dallas)
CICS, COBOL, DB2 (Greensboro, Roanoke, Winston-Salem)
LAN/WAN Network Engineer, Novell, Unix, Routers, Host Connectivity (Va.Beach)
M & D, Millennium (Atlanta)
Macintosh C, C++, Oracle (Raleigh)
Magic Programer Analyst (Virginia Beach)
Natural, DB2 (Winston-Salem)
OMNIS 7 (Raleigh)
SGML/HTML Developers (Virginia Beach)
SHERPA (Dallas)
Sun UNIX (OS/2 and Solaris) LAN Administrators (Dallas, Raleigh)
Tesseract (Richmond)
Windows NT/AS Systems Engineers (Dallas)

Atlanta, GA	800-486-5302		Nashville, TN	800-486-5308	
	Fax	404-843-5930		Fax	615-373-6904
Charlotte, NC	800-486-5291		Orlando, FL	800-486-5286	
	Fax	704-529-6116		Fax	813-286-1011
Dallas/Ft. Worth, TX	800-486-5287		Raleigh, NC	800-486-5289	
	Fax	214-490-4681		Fax	919-783-9305
Ft. Lauderdale, FL	800-486-5305		Richmond, VA	800-486-5290	
	Fax	305-476-9729		Fax	804-285-7895
Greensboro, NC	800-486-5294		Roanoke, VA	800-486-5294	
	Fax	910-665-1844		Fax	910-665-1844
Greenville, SC	800-486-5291		San Juan, PR	800-486-5305	
	Fax	803-297-6799		Fax	809-756-8967
Houston, TX	800-486-5063		Tampa, FL	800-486-5286	
	Fax	713-871-8962		Fax	813-286-1011
Jacksonville, FL	800-823-1319		Virginia Beach, VA	800-486-5283	
	Fax	904-281-1040		Fax	804-491-8215
Miami, FL	800-486-5305		Winston-Salem, NC	800-486-5294	
	Fax	305-476-9729		Fax	910-665-1844

Computer Express, Inc. - a nationally known software consulting organization, with corporate offices located in Boston, is currently looking for a hands-on sales and marketing manager to direct, lead, and manage our new branch office in Ft. Lauderdale, FL.

Sales & Marketing Manager

The ideal candidate will have over five years experience in technical sales, including management of a small sales staff, strong telemarketing and presentation skills, and a proven track record demonstrating individual ability to work hard, to meet goals and to succeed. In exchange for your dedication and commitment, we offer a creative compensation package including base salary, commission, car allowance, bonus plan, cafeteria, medical plan, and more. Interested and qualified candidates are encouraged to contact or send resume in confidence to:

Mr. Michael Harris - President
The Computer Express Companies
301 North Avenue
Post Office Box 308
Wakefield, MA 01880
Outside MA: 800-234-9075
Voice: 617-246-4477
Fax: 617-246-1434

CEI

Interviews will be held in Ft. Lauderdale, FL on February 21st, 22nd, & 23rd, 1995

REUTERS REUTERS REUTERS REUTERS REUTERS REUTERS REUTERS REUTERS REUTERS REUTERS

REALITY IS HERE ... HELP LEAD IT

Reality Online, Inc. a Reuter Company, is one of the nation's leading online personal investment service providers. As a result of our dynamic growth, we seek the following highly motivated professionals

SR. SOFTWARE ENGINEERS—Minimum of 2-4 years Windows (same SDK experience needed) 2 years of C++ and strong knowledge of class library design and usage. Knowledge of personal finance is helpful but not required. (Borland or Microsoft C++ a plus)

SOFTWARE ENGINEERS—Minimum 2 years C++ and knowledge of class library design and usage, minimum 1 year Windows. (Borland or Microsoft C++ a plus)

DATABASE PROGRAMMER/ANALYST—Experience in relational database design and programming with Clipper S87 or Progress 4GL.

At Reality you'll enjoy a highly competitive salary and benefits package plus an informal work environment where creativity results in productivity. For consideration send resume with salary requirements to

Human Resources, REALITY ONLINE, INC., 2200 Renaissance Blvd., King of Prussia, PA 19406. Fax: (610) 278-8118. EOE

REUTERS REUTERS REUTERS REUTERS REUTERS REUTERS REUTERS REUTERS REUTERS REUTERS

ADIA

ADIA has established a strong presence in the major FLORIDA markets. We invite you to join our sunshine team and share in our continued growth. If you have 2 or more years of experience with any skill listed below, you may be as attracted to ADIA as you are to Florida.

WINDOWS | DBMS | SMALLTALK | AS/400 | C++ OOP | UNIX/INFORMIX | POWERBUILDER | OS/2 PM

We offer challenging opportunities and a competitive compensation and benefits package including medical, dental and vision insurance, tuition reimbursement, 401(K) plan, and a promote-from-within policy. Please contact any of the following:

Ft. Lauderdale: (800) 877-9745, FAX (305) 492-0100
Tampa: (800) 975-2342, FAX (813) 975-7234
Jacksonville: (800) 758-2342, FAX (904) 296-0703

An Equal Opportunity Employer.

Once you know about our exceptional resources, challenges and 139-year history of success, you can be hooked on a career with Orvis. Join America's oldest mail-order company today.

Programmer/Analyst

We are seeking a Programmer/Analyst with 2+ years of Application Design and Development experience on an AS/400 and RPG environment.

Requirements for the successful candidate are:
- **Thorough programming skills in RPG**
- **Structured programming**
- **Client/Server and 4 GL experience helpful**
- **Catalog and distribution experience desirable**
- **BS degree in Computer Science or equivalent**

Our environment includes multiple AS/400's, multiple local area network platforms, extensive communications network and a commitment to professional development and reward in addition to an excellent salary and benefits package.

Please send your resume and salary history to:

ORVIS

The Orvis Company, Inc., Historic Route 7A, Department MIS, Manchester, VT 05254-0798

Programmer/Analyst (Memphis, TN). Performance of client customized UNIX/C financial/administrative applications programming & systems design, incorporating SOFTBENCH, X11-WINDOWS and MOTIF software using OBJECT Oriented design methodologies. Bachelor's degree in Math &/or Computer Science & 2 yrs. exp. in job offered. $50,000.00/yr., M-F, 40 hrs./wk. 9-5. Send resumes to: Kathy Malo, Job Serv. Prog. & Tech. Supp., TN Dept. of Employment Sec., Nashville, TN 37245-1200. JO #TN1477148.

Software and Systems Consultant needed for structured system analysis and design application development for a variety of platforms (mainframe to PC's). Will be required to design relational and network databases for applications and assist company with future expansion in the neural network technology for the purpose of assisting clients with their pattern and speech recognition systems. Must have MS in Engineering/Computer Science and two years experience in a Software Consultant position. Salary $37,961 annually, 40 hrs/wk, M-F. Please send resume to Ms. Pat Ganno, Job Service of Florida, P.O. Box C, Clearwater, FL 34618-4090. Job Order #FL 1188205.

Programmer/Analyst

Dallas, Connecticut

Rogers, Casey is a medium sized financial services and consulting firm. Our IS Dept. with advanced technology capabilities, is looking for a talented, intelligent, assertive and mature professional with the following skills:

- ✓ Visual Basic 2.0
- ✓ Microsoft Windows or Windows for Workgroups SDK
- ✓ C++ or C (Microsoft or Borland)
- ✓ ODBC (from Visual Basic, C++ or C)
- ✓ SQL
- ✓ Sybase (Unix or Novell) or working knowl of other relational data bases
- ✓ Understanding of financial instruments and capital markets
- ✓ Multi-platform develop exp a plus

Advanced degree in Computer Science or Finance pref'd, solid exp in the financial world a workable substitute.

Resume to: Recruiting Coordinator, ROGERS, CASEY, 1 Parklands Drive, Darien, CT 06820. E.O.E.

No Calls, Please! FAX 203-656-2233

Midwest

Mississippi State University

Project Leader

Mississippi State University is seeking applications for the position of Project Leader for financial systems. This is a senior level position within Administrative Data Processing responsible for directing, supervising and coordinating the efforts of systems analysts and programming personnel. The person filling the position will be assigned to a broad scope of systems projects to provide direction and control within the specifications of project requirements; will provide technical and administrative direction to the development of new programs and to the maintenance and support of operational systems; will review personnel performance; and will be a direct liaison with the management and personnel of the user departments. Additional responsibilities include fulfilling the detail duties of a systems analyst and those of a programmer, as required.

Minimum qualifications include a bachelor's degree in a computer related field and eight years of successful employment with a record of increasingly responsible experience developing computer systems, two years which must have been as a systems analyst. Any equivalent combination of education and experience may be substituted if approved by the hiring official and the department of Human Resources Management. Candidates must possess considerable knowledge of general management theories and techniques; thorough understanding of general accounting principles; expertise in systems analysis; strong programming skills; and experience with a relational data base management system. Excellent interpersonal and communication skills are essential. Desirable qualifications include supervisory experience; and knowledge and/or development experience with Oracle, C, Cobol and/or Unix.

Applications will be accepted through March 24, 1995 or until position is filled. Interested candidates should submit a letter of application, resume and the names of three references to: **Danny M. Kemp, Mississippi State University, Computing Center and Services, P.O. Box CC, Mississippi State, MS 39762.** MSU is an AA/EEO Employer.

SOUTHEAST

Work and play in one of the most desirable areas:

beaches • mountains lower cost of living year-round golf • lakes

- Client Server
- Mainframe
- Networking

ACP

Salaried • Full Benefits • 401(k) Referral $

American Computer Professionals, Inc.
P.O. Box 11188
Columbia, SC 29211
800-833-8227
Fax: (803) 779-1965
(803) 256-3222
Internet: ACP@SCSN.NET

equal opportunity employer

Software Engineer. Supervise, direct, and implement the development of software/hardware systems for retail users of the petroleum industry in the U.S. and overseas. Must have a minimum Bachelor's in Computer Science, 2 years experience in business software development, be thoroughly familiar with and proficient in Unix, C, Progress 4GL, Time & Attendance systems, Point of Sale, Back Office, Case Tools, South African currency, sales tax, and metric system, willing and able to travel overseas approx. 4 times/year (3-4 wks./trip), and present proof of legal authority for full-time employment in the U.S. M-F, 8:30AM-5:30PM, $43K/yr. Those interested and qualified, send resume, or apply in person, to GA Dept. of Labor, Job Order GA 5818278, 2972 Ask-Kay Drive, Smyrna, GA 30082-2309 or the nearest DOL Field Service Office.

ORACLE Administrator

ARI, a leader in the fleet leasing industry, is proud of its reputation for state-of-the-art customer information systems. We have an immediate opening for a professional with a minimum of 3 to 5 years experience administering an ORACLE database. Data modeling and client-server experience is required. GUI development is a plus. Project management and excellent communication skills a must. Responsibilities include the development and support of end-user applications and tools. We offer a highly competitive compensation and benefits package.

Our company is a growing business set in a positive working environment. We are located in Mt. Laurel, NJ (near Cherry Hill, NJ and Philadelphia, PA) in an attractive corporate campus setting.

We are also seeking resumes for Programmer/Analysts with 5 years COBOL experience.

Please respond to: **ARI, Dept. MG-OA1, 9000 Midlantic Drive, Mt. Laurel, NJ 08054.** Pre-employment drug screening conducted. Only those chosen for further consideration will be contacted. EOE.

ARI
The Fleet Management Professionals

COBOL ■ MVS ■ VSAM ■ JCL ■ HOGAN ■ CICSCOBOL ■ MVS ■ DB2 ■ MVS TECH SUPPORT ■ COBOL ■ DB2 ■ MVS TECH SUPPORT ■ DB2 ■ EASYTRIEVE PLUS ■ TANDEM ■ STRATUS ■ IMS ■ TSO/ISPF ■ EASYTRIEVE PLUS ■ CICS ■ VSAM ■ SQL ■ IMS TECH SUPPORT ■ CICS ■ VSAM ■

Log on at NationsBank... and connect with the leader.

Log on to a system that gives you the freedom to explore, the opportunity to learn, and the power to excel...NationsBank. As one of the largest financial institutions in the country, we're a leader in our field because our employees are driven to be innovative, supportive and proactive. We attract national attention because we provide individual attention. Join us at our Corporate Headquarters in Charlotte, NC, and log on with a leader.

■ Sybase/UNIX Database Administrator

This position supports Sybase and additional RDBMS in a UNIX Operating System. Must have 3–5 years of experience working with SQL Server performance and tuning. Knowledge of Gateway Configuration, UNIX Shell Scripts, TCP/IP, Powerbuilder, DB2 and IBM Mainframes would be a real plus. Experience with distributed database design, UNIX/AIX, and C/S RPC Development preferred. **Job Code: DMF-HC2.**

■ DB2 Database Administrator

Will perform installation, documentation, standards/procedures, and problem diagnosis/resolution for system software and support products. Will also design, code, test and document complex system support programs and provide technical support where needed. Must have a Bachelor's degree and at least 4 years of related experience. **Job Code: DMF-HC.**

■ IMS Database Administrator

Will develop and support recovery procedures for IMSVS DB/DC and FastPath Databases in a data sharing environment running full-function DBRC. Disaster recovery experience and IMS Application programming experience desired. **Job Code: DMF-HC3.**

■ IBM Mainframe Programmers

Candidates must have strong COBOL, FOCUS, and EZTRIEVE+ programming experience. IMS DB Online and batch coding skills along with knowledge of ISPF, SDSF, JCL Fileaid preferred. Knowledge of Genesys desired. Excellent organization, problem-solving, and analytical skills required. **Job Code: DMF-MJP.**

■ Lotus Notes Programmer

Must have 1–3 years of experience developing Lotus Notes database and applications. Familiarity with Lotus Notes VIP a plus. Experience working with the Notes API desirable. Will be required to provide enhancements to existing notes applications. **Job Code: DMF-JB.**

■ PC Programmer

Client-server integration skills. PC-LAN/WAN programming and GUI front-end development experience required. Visual Basic, MS Access, SQL Database and AS/400 experience are all preferred. **Job Code: DMF-BO.**

■ Telecommunications Professional 1

This individual will stay abreast of emerging network technology, develop techniques to facilitate technology insertion into existing internetwork environment, and provide expert consultative services across all Telecommunications functional areas with emphasis on WAN Backbone and rapidly growing requirements for client server application. Must have 5 years of experience with Network topologies, Ethernet, Token Ring, TCP/IP, IPX, SNA and Nethios. **This position will be located in Richmond, VA. Job Code: JPM-R/N1.**

■ Telecommunications Professional 2

Will provide Network Engineering and Design in support of NationsBank LAN/WAN. Must have 3–5 years of experience with LAN/WAN topologies and protocols as well as knowledge of Ethernet, Token Ring, TCP/IP, IPX and Nethios. Experience with Physical Distribution and delivery systems such as cabling and wiring standards, Fiber Optics, Routers, Intelligent Hubs, and associated configurations as it relates to design are required. **This position will be located in Richmond, VA. Job Code: JPM-R/N2.**

■ Telecommunications Professional 3

This individual will serve as the "telecommunications consultant" to a broad range of technical and strategic projects. Must have 10 years of experience in telecommunications technology and management, an indepth telecommunications knowledge including LAN/WAN and voice/data systems, an understanding of emerging telecommunications technology and industry standards, and exposure to a broad range of technologies. **Job Code: JPM-CG.**

■ Capital Markets Information Technology

Positions are available for highly-motivated candidates with any one of the following capabilities in our expanding and cutting-edge technology group: NEXTSTEP programming experience (all levels), object-oriented development using C++ in preferably a UNIX environment (PC experience OK, minimum of 2 years required), experience in developing financial models preferably capital markets-oriented for at least 2 years, and database development or administration (minimum of 2 years of Sybase experience preferred). **Job Code: DF-RC.**

All positions require strong written and verbal communication skills, and the ability to interact effectively with senior bank management personnel. NationsBank offers competitive salaries and a comprehensive benefits package. Interested candidates should send resume to: **NationsBank Personnel, Job Code_____, NationsBank Corporate Center, NC1-007-21-08, 100 N. Tryon Street, Charlotte, NC 28255. Principals only — NO PHONE CALLS PLEASE.** NationsBank is an Equal Opportunity Employer M/F/D/V.

NationsBank

© NationsBank Corporation 1995

Midwest

AT CPI, we've got the kind of opportunity you can really warm up to.

We're the nation's leader in mortgage and financial automation, enjoying energizing growth and increasing demand for our quality products and services. For those who'd like to make a "powerful" contribution in a creative environment – while enjoying the many advantages of our Jacksonville, Florida location – the professional options include:

INTERCHANGE NETWORK PROJECT LEADER

Requires 5+ years of experience in telecommunications, familiarity with WAN and LAN issues, and ability to understand new technologies and products. Must have a relevant bachelor's degree, strong written and oral communication skills, and expertise to develop/implement plans for providing additional functionality as desired by our clients and business partners. Mortgage industry background or understanding of mortgage industry transactions a plus. RESPONSE CODE: 721

TECHNICAL ANALYST

Requires 5+ years of PC-to-mainframe communication experience and proficiency in object-oriented programming techniques using Visual C++, Win32 and Visual Basic. Must have a degree in computer science, good working knowledge of networks and databases, effective written and oral communication skills, and the ability to convert ideas into state-of-the-art mortgage applications. Mortgage industry experience a plus. RESPONSE CODE: 794

SQL SERVER SPECIALIST

Requires 5+ years of progressive systems development experience with emphasis on relational database SQL Server access. Exposure to Microsoft SQL Server, Oracle or Sybase preferred. Must have a B.S. in computer science, excellent written and oral communication skills, and demonstrated ability to define stored procedures, remote procedure calls and other data access derivatives. Knowledge of C, C++ and Visual Basic a plus. RESPONSE CODE: 823

If industry-innovating challenge in a balmy, breezy setting intrigues you...take a look at Computer Power, Inc. Relocation to Jacksonville is included in our benefit package. Send your resume and salary history (with selected Response Code) to Attn: Cathy Welch, Computer Power, Inc., 601 Riverside Avenue, Jacksonville, FL 32204-2987. FAX: 904-634-4282. No phone calls, please. Equal Opportunity Employer M/F/V/H

CPI COMPUTER POWER, INC.
The Power of Experience

OPPORTUNITIES FOR COMPUTER-WISE PROFESSIONALS

Law School Admission Council, a higher education service organization that develops and administers the LSAT has the following opportunities:

QUALITY ASSURANCE ANALYST

Responsible for managing the quality of the company production environment by implementing and overseeing a change control mechanism for new and updated products and services from the test/development environments to the production environment. Duties also include facilitating a "zero defects" products and services" environment involving thorough performance testing of all IT components, controlling access to sources and object code, and overseeing the straight methodology for naming and documenting non-standard or one-time process.

College degree in business administration or computer science required. Excellent writing and verbal communication skills, and the ability to perform management-oriented work. Three years' experience in quality assurance analyst/technician in a multi-processor, multi-platform processing environment. Oracle and Power Builder experience preferred. A minimum of two years' supervising and management experience in a products environment required. (Code: QAA)

DATABASE ADMINISTRATOR

Responsible for providing technical and organizational leadership for the company's physical Oracle database and UNIX software operating environments. This includes overseeing the development, organization, and performance evaluation of physical databases on an enterprise basis over all platforms, the assessment and implementation of new database technologies, maintaining the software integrity of the production environment and providing a long-term perspective on the relationship of physical databases technology to the data and process requirements of the enterprise. Duties also include the training and development of staff in online database technology.

Minimum Bachelor's degree in Computer Science or related field. Master's degree is preferred. Three years' installation and support experience with relational databases and transaction processing systems, preferably in multiple platform hardware and software environments. Experience with Oracle databases components preferred. Three years' broad experience with various application and performance/capacity products in a multiple platform environment. (Code: DA).

To apply, please send resume and letter of application, (indicating Job Code on envelope) to: C. Rommel, Human Resources Office, Law School Admission Council, P.O. Box 40, Newtown, PA 18940. Application deadline is March 3, 1995. Only resumes with salary requirements will be considered.

Law School Admission Council is an equal opportunity/affirmation action employer and encourages applications from members of minority groups.

LAW Services

FLORIDA

Permanent and contract opportunities:

ORACLE, FORMS, SQL
AS/400 RPG 3/400, ACCT
CASE W/ PACBASE
C/S Development
C, C++, UNIX, R/T
C, X 11 & MOTIF, UNIX, Graphics
DBA, SQL, S/W W, UNIX
*Signal Proc, R/T, UNIX, C
ATM or Frame Relay, C

NAS, Inc.
4890 W. Kennedy Blvd. #300
Tampa, FL 33609-1857
Call 813/282-9334
Fax 813/281-0990
Internet: hrstaffing@nas.com

FLORIDA - 80 DEGREES!

PERMANENT & CONTRACT

DB2, IDMS or IMS P/A's	to $56K
AS/400 P/A's	to $52K
HP 3000/9000 P/A's	to $58K
FOCUS (or) RDB P/A's	to $54K
SYBASE (or) ORACLE	to $62K
CICS (or) MSA P/A's	to $53K
SAP SOFTWARE P/A's	to $88S

For immediate consideration call EDI or FAX your resume to (305) 963-4333.

EDI SYSTEMS
450 N. Park Road #320
Hollywood, FL 33021
(305) 962-9444
email: edifla@aol.com

ANOTHER REASON WHY COMPUTERWORLD RECRUITMENT ADVERTISING WORKS ...

Computerworld reaches large numbers of the computer job titles most companies recruit regularly.

Whether you're looking for programmers, software developers, systems analysts, engineers, IS directors, consultants, sales/marketing professionals, or just about any other kind of computer professional, Computerworld delivers the largest available audience of them.

Computerworld's Total Audience by Job Function

Function	of Computerworld's Audience...
Information systems management & staff	331,594
Readers in user departments & areas	65,170
Sales/marketing & product management	46,627*
Engineering management	25,205
Corporate management	21,024
Other	22,744
Total	505,423**

SOURCE: Still Survey of Computerworld's Audience, August 1993.
* Includes 6,941 complimentary copies distributed to Information Systems sales and marketing professionals.
** Total readers of paid subscriber copies

To place your advertisement regionally or nationally, call John Corrigan, Vice President/Classified Advertising, at 800/343-6474 (in MA, 508/879-0700).

COMPUTERWORLD
Where the qualified candidates look. Every week.

INFORMATION TECHNOLOGY PROFESSIONAL

Welcome to National Starch and Chemical Company, 100 years young and a recognized global leader in specialty chemicals and related products. With sales of over $2 billion and annual profits exceeding $180 million, we can offer a rare opportunity at our world headquarters near Somerville, New Jersey.

Our future is linked to our commitment to leading edge technology.

The professional we seek will have a blend of talents -both business and technical. You'll be capable of recognizing and identifying business needs and recommending appropriate IT-based solutions. In doing so, you should be well versed in business principles (including manufacturing and financial) and how they are affected by industry and economic trends and conditions, and equally conversant on the technical side with experience in open systems, client/server, etc.

Qualified applicant will have 10+ years proven and varied experience and preferably a degree in business. You also must be a team oriented, proactive self starter with excellent interpersonal and communication skills, and the ability to "make things happen." Occasional travel required.

When you join the National team you'll receive an attractive starting salary, excellent benefits and ample opportunity for professional growth and advancement within our stable, success oriented environment.

Send resume with salary history or fax 908-685-5005 in confidence to: Donna Lesnowski, Ref #245, Corporate Employment, National Starch and Chemical Company, 10 Finderne Ave., Bridgewater, NJ 08807.

An Affirmative Action Employer M/F. Principals only, please.

National Starch and Chemical Company

Develop automatic manufacturing software for the metal fabrication industry. Identify manufacturing problems & recommend solutions for customers w/ plasma cutters by using knowledge of manufacturing & plasma. Perform research to develop new software to maximize clients' resources such as tooling by using the chaos & time series analyses concept. Answer technical questions from Asian client base. Min req. inc. Ph.D. in M.E. w/ 1 yr exp. in above pos. or 1 yr exp. as Mech. Engineer or related w/ ability to do complex mathematical & numerical analyses in the development of manufacturing software. Other req.: 1 grad course in 1) Fractal Images 2) Chaotic Dynamics 3) Plasma Dynamics 4) Time Series Analyses 5) Numerical Analysis. Able to speak, read, & write Chinese. $40,000/yr. 8:00-5:00. Please send resume to: Job Service of Florida, 2312 Gulf-to-Bay Blvd., P.O. Box C, Clearwater FL 34618-4090. Re: Job Order No. FL-1190504

MIS RECRUITER

ADIA Information Technologies has over 1400 consultants, and our growth continues to outpace the industry. We are currently seeking an experienced MIS Recruiter for our Ft. Lauderdale office. The ideal candidate will have industry experience and a proven track record.

We offer a competitive compensation package and benefits. For immediate consideration, qualified candidates may FAX resume to 305-492-0188 or call

800-877-9745

Matthew Thornton Health Plan
Quality of Life
Quality for Life

Matthew Thornton Health Plan located in southern New Hampshire, is seeking a Programmer/Analyst with advanced MLM/PS programming experience. Prior health care systems and personal computers experience is preferred. Must have strong communication, technical and planning skills.

Please send your resume and salary requirements to Human Resources, MTHP, PO Box 2028, Nashua, NH 03061-2028. Be sure to mention that you saw this job advertised in Computerworld.

For other openings, call our jobline, 1-603-891-1750

Matthew Thornton Health Plan is an equal opportunity employer

NEW PRODUCTS, NEW PROJECTS, NEW PROGRAMS



At Harris Computer Systems Corporation, we are excited about our future as a supplier of world-class, high-performance Night Hawk(TM) real-time and Cyberguard secure computer systems. Ongoing expansion has created immediate opportunities for Software Engineering and Sales/Marketing professionals who seek stability, growth and challenge.

SOFTWARE ENGINEERING PROFESSIONALS

UNIX Kernel Software Development

Applicants must possess knowledge of the UNIX SVR4 kernel, real-time functionality and performance and related operating system concepts. Any experience with the UNIX kernel and/or multiprocessor concepts and performance tuning will be considered, as will microkernel-based experience. Degree (or equivalent) in applicable discipline and 2+ years of relevant experience also required.

Compiler Software Development

Chosen candidates will develop common code generator technology for compilers using state-of-the-art code generation and optimization methodologies. Must possess experience with compiler technology. Knowledge of code generation, optimization and Power PC RISC architecture a definite plus. Degree (or equivalent) in applicable discipline and 2+ years of relevant experience also required.

SALES/MARKETING PROFESSIONALS

Senior Account Managers

Successful candidates will find that our new computer products and alliances have created opportunities in the areas of data security, privacy protection and worldwide applications (including flight trainers, radar control/analysis, seismic data acquisitions and secure communications gate guards). We have also minimized the paperwork, so that you can spend more time prospecting, following leads and closing orders. Positions require BSEE, BSCS or equivalent experience. Computer sales experience and/or product knowledge is preferred, although other technical sales experience may be considered. In return for your results-driven talent, we offer a compensation program with NO CAP on incentives and a built-in accelerator. Positions are now available in the following areas: **Washington D.C.; Ft. Walton Beach, FL; Boston, MA; Philadelphia, PA; San Francisco, CA; St. Louis, MO; Tulsa, OK; Salt Lake City, UT; Seattle, WA; Detroit, MI; Los Angeles, CA and Raleigh/Durham, NC.**

Marketing Managers

Selected applicants will analyze/qualify potential customers and product needs, determine markets and recommend promotional activities. Must possess the knowledge to be active in research, data base management, program generation, competitive analysis and win/loss analysis. Previous exposure to the computer industry and a strong technical background also essential. An MBA would be a plus. Salary to $60K.

Marketing Communications Specialist

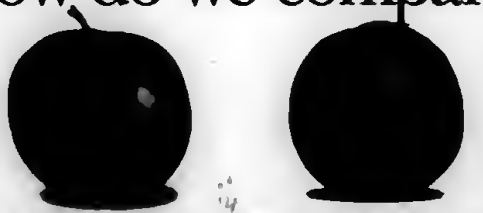
Chosen candidate will generate newsletter articles and product marketing literature (from writing through design and production). At least three years of high-tech marketing experience is required, as is a strong understanding of computer terminology and applications, desktop publishing, graphic design and production. Previous experience with trade shows, media relations or advertising also helpful. RSCS a plus. Salary to $45K.

To be considered for any of the opportunities listed above, please submit your resume, indicating position of interest, to: R. Thomas Welch, Harris Computer Systems Corporation, Dept. CW/0220, 2101 W. Cypress Creek Rd., Ft. Lauderdale, FL 33309. Equal opportunity employer M/F/D/V.

HARRIS
COMPUTER SYSTEMS CORPORATION

INFORMATION TECHNOLOGY

How do we compare?



It's like comparing apples to oranges. Cap Gemini, the global leader in information technology and a partner to an impressive array of world renowned corporations, is launching a major initiative in ST. LOUIS.

These opportunities involve on-site work in St. Louis for a multi-year contract. We are looking for I.T. professionals with business acumen and technical skills from a variety of resources which include: Project Managers, Systems Analysts and Developers in the following areas:

CLIENT SERVER
Oracle (Financials) • Windows • Easel • SQL • Visual Basic • DB2/2 • C/C++ • Lotus Notes • OO Develop/Designer • Prism • RS6000 • SmallTalk

MAINFRAME
CICS • VSAM • COBOL • IMS DB/DC • DB2 • Focus • Datacomm/Ideal

MIDRANGE
AS/400 • OS/400 • RPGIII

OTHER NEEDS
DBA • Logical • Physical • Mainframe and Open Systems

Don't miss out on the extraordinary and exceptional career opportunities that exist in St. Louis and other Midwestern locations. To be part of our initiative to hire 60 Consultants in 90 days, mail or fax your resume to: **Staffing, Cap Gemini America, 509 Olive Street, Suite 304, St. Louis, MO 63102. FAX: 314-231-5594.** We are an equal opportunity employer.

CAP GEMINI AMERICA
Member of the CAP GEMINI SOGETI Group

Total Respect • FOR YOUR FUTURE

Computer Software Consultant for computer and engineering systems contractor. Program and admin of ORACLE RDBMS database on worldwide internet network. maint of database structure and data backup, restoring and archiving, enroll new users and maint system security, modify database structure when necessary, perform and config tuning, schedule and distrib data input/output from network users on mult. platforms and operating systems, install and upgrade ORACLE server and various applic. tools operating environ. incl. VAX/VMS, PCs, LAN/WAN, UNIX, Mac, MS-Windows, and X Windows. MIN QUAL: M.S. Computer Based Information Systems, 2yrs exp. as Computer Programmer/Analyst or Specialist. Exp. must incl. 1) Program and admin of ORACLE database, 2) Database tools - SQL*Reportwriter, SQL*Forms, SQL*Menu, and Microsoft Access, and 3) Operating environ. VAX/VMS, UNIX, Mac, Windows. M-F, 8am - 5pm. $40,470/yr. Employer Paid Ad. Send resume to Michigan Employment Security Commission, 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. REF #28095.



PowerCerv Is Looking For Technical Leaders

As the undisputed leader in PowerBuilder® technical mentoring services, our explosive growth has created opportunities for PowerCerv PowerBuilder professionals in Atlanta, Birmingham, California, Charlotte, Dallas, Miami, Minneapolis, New York, Orlando, Portland, Tallahassee, Tampa and Washington, D.C. We seek customer-driven professionals with a minimum of six months experience with PowerBuilder application development.

PowerCerv is the largest channel provider of PowerBuilder products and services in North America. Our clients seek our expertise to help design, develop and deploy mission-critical PowerBuilder applications. PowerBuilder is our exclusive development discipline resulting in a track record of providing the best graphical client-server solutions to Fortune 1000 clients.

PowerCerv is a C++/OA Software Developer with leading PowerBuilder channel products such as the award-winning PowerWAVE™ (Object Class Library), PERFORMER® (the First Library Optimizing Workflow), Navvo™ Marketing®, extract Management System, Response™ Help Desk/Customer Support System and PowerPAK™ GUI® II Productivity Control.

PowerCerv offers tailored training, career advancement, competitive salary plus bonus, 401K and full employee health and dental benefits.

If you're looking for a challenging, and rewarding environment where technical excellence and customer satisfaction is not just a requirement, but a way of life, send your resume, salary history and location preference in confidence to:

Ken Weatherly
PowerCerv • 400 North Ashley Drive, Suite 1010 • Tampa, Florida 33602
or FAX 813-222-0000

PowerCerv

ATTENTION: HIRING MANAGERS

When you compare costs and the people reached, *Computerworld* is the best newspaper for recruiting qualified computer professionals. Place your advertisement today!

Call toll-free 800-343-6474 ext. 201
(In MA, 508-879-0700)

Leading the Nation in Technology Resources

Advanced Business Consultants

Join a leader serving Fortune 500 companies. We offer attractive compensation, a comprehensive benefits package and relocation assistance. ABC has immediate openings nationwide for these skills:

- **DB2/CICS**
- **IEF**
- **Client/Server**
- **Oracle**

Call or fax resume to Bill Marks:
1-800-869-2121
913-362-3256 FAX
Internet: abc@tyrell.net

Department of Computer Science
College of Natural Sciences & Mathematics
Indiana University of Pennsylvania

INDIANA UNIVERSITY OF PENNSYLVANIA invites applications for a tenure track position in the Computer Science Department to begin in the Fall of 1995. The appointment is anticipated at the Assistant Professor rank. The Associate Professor rank is possible in the case of individuals with exceptional qualifications.

Duties involve undergraduate teaching, advising, curriculum development and committee assignments. The applications-oriented bachelor's program emphasizes preparation of its graduates for immediate productive employment.

The qualified candidate should possess a Ph.D. in Computer Science or a related field. Demonstrated teaching ability and related industrial or professional experience are desirable. Salary and rank depend on qualifications; a complete fringe benefit program is provided; summer assignments are available. Applications will be evaluated beginning March 31, 1995.

Send letter of application and resumes to Dr. Gary Buterbaugh, Chair, Computer Science Department, 319 Stright Hall, Indiana University of Pennsylvania, Indiana, PA 15705-1087, telephone (412) 357-2524.

IUP is an Affirmative Action/Equal Opportunity Employer

EXCELLENT CONTRACT & CAREER OPPORTUNITIES

CONTACT:
J. Wong
SEI
P.O. Box 2167
Corona, CA 91718

- SAP R/2, R/3 ALL MODULES NATIONAL & INTERNATIONAL LOCATIONS
- ORACLE FINANCIALS TRITON, MARSHAL
- SYBASE, ORACLE DBA'S C++
- IEF CASE TOOLS BSD THRU CONSTRUCTION
- UNISQL, REDBRICK,
- TERADATA WAREHOUSE

FAX# 800-576-3858

E Mail:
72722.1664@Compuserve.Com

data processing

LEAD ARCHITECTS

COMDISCO, INC., is a global leader in high technology, asset management and disaster recovery services with a reputation for innovation and excellence supported by over $5 billion in assets.

Our Systems Integration Division is poised for rapid expansion in 1995.

Our innovative approach to Systems Integration is creating the need for senior technical leaders capable of providing the state-of-the-art solutions our Fortune 500 clients have come to expect.

The successful candidate will report to the Chief Architect in one of four fields.

- **Desktop Systems: Hardware and System Software**
- **Server Systems: Mainframe, Mid-Size, UNIX, and Database**
- **Network: Connectivity and System Management**
- **Object Technologies and Application Development**

Applicants should have at least 10 years of experience in at least one of the above 4 fields, as well as hands-on experience with and knowledge of products in the relevant field(s). In addition, we require experience as the primary Technical Lead Architect, for a large, complex Client/Server system. Familiarity with current industry standards and methodologies coupled with experience in testing, design, development and implementation is required. The ability to interact with customers and vendors at senior levels completes your qualifications.

As a multi-million dollar world leader and Fortune Service 500 company, COMDISCO, INC., offers a very competitive salary, excellent benefits, and many opportunities for professional development. Please forward your resume and salary requirements to: **COMDISCO, INC., Dept. SISD/LEAD, 6111 N. River Road, Rosemont, IL 60018** or by fax to: **(708) 518-5008.** EOE M/F/D/V.

COMDISCO

California & the Carolinas Consulting Assignments

Mainframe / Legacy: IMS, APS, DB2, CICS, COBOL, Telon, Adabas, Natural, Ideal, CSP, IEF, SAS, Focus, DEC COBOL / RDB, DEC Basic

Mid-Range: AS400, COBOL, RPG, J D Edwards

Client Server / Micros: Oracle, Visual Basic, Smalltalk, Powerbuilder, Informix, Sybase, C++, C/UNIX, Windows, Enfin, OS2

S M C I

Carolinas: (704) 375-5788
Fax: 375-5699
smcc@ix.netcom.com

California: (818) 240-3177
Fax: 240-7189
smci@ix.netcom.com

MIDRANGE & C/S PROFESSIONALS

Immediate opportunities for experienced AS/400-RPG and Client/Server developers with experience in financial, data base marketing, manufacturing, or sales analysis applications.

- Systems Analyst -
- Applications Programmer -

Leanin' Tree Inc., America's premier marketer of western art consumer products, provides a fast-paced, innovative environment in Boulder, Colorado, where information technology drives business results.

Non-smokers. Contact us by fax or mail: Fax 303-581-2151

LEANIN' TREE Inc.

6055 Longbow Drive, Boulder, CO 80301

CONSULTANTS

CW Systems Inc. currently has several openings for:

Project Managers
Access, Visual Basic
CICS/COBOL

For immediate consideration, please send your resume to:

14643 Dallas Pkwy, #865
Dallas, TX 75240
phone: 800-375-4684
fax: 214-980-9076
compuserv 74671,2362

CONSULTING-TOP RATES

Programmers, PM's, Package Specialists, Database Specialists, Midrange, Client Server GUI, PC-Mainframe, enemy application background.

Our reputation for excellence is unparalleled in the industry and we pay top rates to our staff. If you've never consulted, or are a seasoned consultant, get in touch today to see if your expertise is a match to one of our numerous available positions in the NY metro area, the midwest, the southwest & the west coast. Don't wait.

Call/send/fax your resume today to:

TelTech Corporation

[illegible]

Toll free outside Manh. area: 800-648-5572
Metro: (212) 514-3448
24 hour fax (212) 514-3506

Senior software engineer 40 hrs $756 per week. Two years college in computer programs. Four years experience in job with minimum two years experience in telephone and smart card systems design from initial requirements to final production. Hardware knowledge to include Intel 8051, Motorola 6811, AMC-PIC 16CXX. Software knowledge to include pim51, asm51, Microsoft C and Orcad. Must have knowledge of telephone network systems and smartcard system design. Person will analyze customer requirements then design, manufactura and test combinations of electronic circuits and software in the development of new card operated telephones and other commercial products that benefit from the use of smartcard technology. Send resume to Florida Jobs and Benefits Center, 2660 West Oakland Park Blvd., Fort Lauderdale, FL 33311-7347. Ref. Job order number FL-1162948.

SOFTWARE ENGINEER (2 positions) 40 hrs/wk, 8 a.m. - 5 p.m. $44,100/yr. Design, develop code and test computer software application systems on IBM mainframe utilizing MVS, DB2, CICS, CSP and COBOL. Prepare program specifications, test plans and test cases. Reqr. Bachelor's Degree in Computer Science. Reqr. 3 yr. exper. in job offered, or 3 yr. exper. as Systems Analyst/Programmer and/or Data Processing Officer. Reqr. work exper. in development of s/w systems on IBM m/f utilizing MVS, DB2, CICS, CSP, and COBOL. "Employer paid ad." E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. No. 32595.

Programmer/Analyst (Will travel between Orlando and Tampa, FL client sites) Analyze requirements, design, develop, code, implement and maintain banking applications systems using RPG/400 in an AS/400 environment. Bachelor's Degree in Engineering, Comp. Sci., or Math + 2 yrs. exper. in job req. $37,000/yr., 40 hr/wk, 8:30 a.m. - 5 p.m. Send resume to Job Service of Florida, 3421 Lawton Rd., Orlando, FL 32803. RE: Job Order No. FL-1186089.

PROGRAMMER/ANALYST (2 positions) 40 hrs/wk, 8 a.m. - 5 p.m., $39,000/yr. Design, develop code and test computer software application systems in an IBM mainframe environment utilizing MVS/XA, DB2, IMS/DB, IMS/DC, CICS and COBOL. Prepare test suites and assist in implementation of the systems. Reqr. Bachelor's degree in Computer Science. Reqr. 1 yr. exper. in job offered, or 1 yr. exper. as Systems Analyst and/or Assistant Systems Analyst/Programmer. Reqr. work exper. in development of s/w systems on IBM m/f utilizing MVS/XA, DB2, CICS, IMS/DB, IMS/DC and COBOL. "Employer paid ad." E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. No. 30895.

Over one half million computer professionals read Computerworld weekly.

Computerworld recruitment advertising works!

That's because more computer professionals read more recruitment advertisements in *Computerworld* than in any other newspaper.

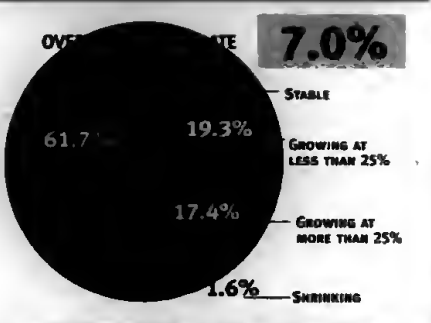
For more information or to place your ad, call Lisa McGrath at 800-343-6474 (in MA, 508-879-0700).

Weekly. Regional. National. And it works.

An IDG Communications Publication

CAREER SURVEY: Computer Hardware

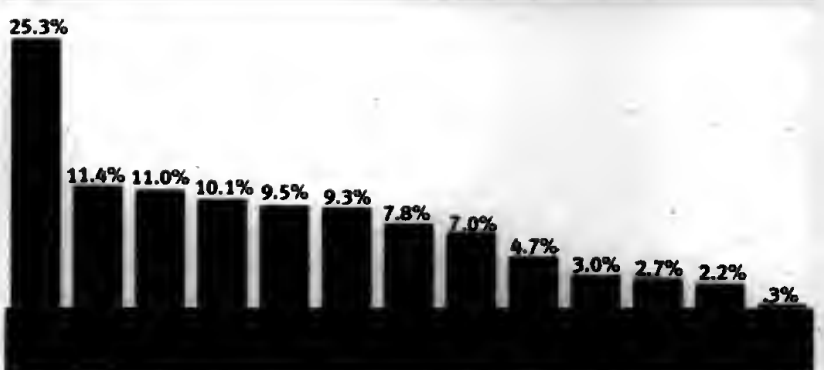
INDUSTRY HIRING TRENDS



SURVEY BASIS: 2483 TECHNOLOGY FIRMS INVOLVED IN COMPUTER HARDWARE

SURVEY CONDUCTED BETWEEN NOVEMBER '94 AND JANUARY '95.

REGIONAL GROWTH ANALYSIS



CORPTECH, A DIRECTORY PUBLISHER IN WOBURN, MASS., TRACKS THE U.S. 35,000 TECHNOLOGY MANUFACTURERS. THIS SURVEY RELATES TO THE 29,383 TRACKED FIRMS WITH FEWER THAN 1,000 EMPLOYEES.

© Copyright 1995, Corporate Technology Information Services, Inc., Woburn, Mass.

Make the Leap!

Looking for career stability, flexibility, opportunity to relocate, and a supportive and rewarding environment...then you are ready for a **Quantum leap.**

For over 25 years we've been a respected international leader. We have doubled our size in the last 2 years and are continuing to rapidly expand in the U.S.. Outstanding opportunities exist for goal-oriented, ambitious individuals, like yourself, to be a part of our team.

We currently seek top notch professionals with the following expertise:

POWERBUILDER or VISUAL BASIC
Full development team required to redesign business applications using state-of-the-art technologies.

COBOL, CICS, DB2
Programmer/Analysts with two or more years of maintenance or development experience required. Exposure to insurance or pharmaceutical applications is an asset.

COBOL, IMS DB/DC
Programmer/Analysts with a minimum of two years experience required to work in a large team environment developing and maintaining insurance applications.

UNISYS 1100/2200 with COBOL or FORTRAN
Programmer Analysts with a minimum of two years experience required. High-volume on-line transaction experience is desired.

Our outstanding salaried career positions offer a highly competitive compensation package including full benefits, tuition reimbursement, and relocation assistance where needed. Successful candidates who are prepared to accept assignments in Philadelphia or New Jersey should inquire about our guaranteed Atlanta relocation and house purchase bonus plans. **We are committed to training successful candidates in a client server oriented technology within their first year with Quantum.** To investigate these exciting opportunities call or fax your resume in confidence to:

Carol Zamprogna, Personnel Coordinator
200 Middlesex Essex Turnpike, Suite 200, Iselin, NJ 08830
(800) 274-7004 FAX: (908) 283-4892
Only candidates seeking permanent, salaried career positions need apply.
Equal Opportunity Employer

quantum
INFORMATION RESOURCES INC.
NEW JERSEY · PHILADELPHIA · ATLANTA



LEAPFROG OVER THE ORDINARY JOB!

Come to Albuquerque for extraordinary Information Systems Opportunities! **Presbyterian Healthcare Services,** a recognized leader in the healthcare industry, currently seeks systems professionals to build the business and clinical systems for healthcare delivery of the future. Current opportunities include:

APPLICATIONS DEVELOPMENT MANAGER
Leadership role over multiple systems development & maintenance projects, working with user management to define strategies & priorities and resolve issues. Requires 5+ yrs. related MIS experience and 3 yrs. managing teams of 6 or more members. Must have a proven track record in successful application of information technology to enhance business capabilities, the ability to justify investments through cost-benefit analysis and an understanding of client-server computing, project planning and structured application development methods. Strong vendor negotiation and interpersonal skills are also required.

CLINICAL APPLICATIONS DEVELOPMENT MANAGER
Same as above, but with clinical experience or training required.

SYSTEMS DEVELOPERS
Work in a team setting as a Project Leader, Technical Analyst and/or Business Analyst to develop, enhance and maintain business applications and train/assist other systems analysts and application users. Responsible for technical design & construction of systems. Requires 3+ yrs. systems programming & analysis experience, 2+ yrs. in client-server application development and 1 yr. in a supervisory role. Must have experience with C, GUI and SQL programming and UNIX & MS Windows OS as well as a history of close interaction with user departments. Experience with CASE tools, rapid application design tools, PowerBuilder and/or SyBase preferred.

INFORMATION TECHNOLOGY PLANNING DIRECTOR
Coordinate the annual & strategic planning activities of our healthcare I.T. function to assure alignment with our evolving business model. Stay attuned to user & business needs as well as advancing technologies and evaluate user satisfaction. Requires 6 yrs. MIS experience including at least 3 yrs. in computer operations, technical support or applications development. Must have excellent group facilitation and written/verbal communication skills. Benchmarking of computer systems strongly desired. Healthcare background and Master's degree preferred.

We offer competitive salaries and a customized benefit plan. Please send resume including salary history to: **Presbyterian Healthcare Services Employment Office, Attn: Nancy Whitesell CW, P.O. Box 26666, Albuquerque, NM 87125-6666.** EOE.

PRESBYTERIAN
Healthcare Services

CONSULTANTS COMMUNICATION & COMPUTERS SAUDI ARABIA

Al-Khaleej Computers requires Consultants for the largest oil company in the world on one-year renewable assignments. We offer excellent TAX-FREE salaries & benefits: Int'l. transport, free housing, medical insurance, local transport allowance, paid vacation leave.

COMMUNICATIONS ENGINEERS - with 10 years experience in the design and installation of data network infrastructure and LAN/WAN Systems. ATM experience (Asynchronous Transfer Mode) would be a plus but is not required.

ANALYSTS - with at least 5 years experience in a combination of DB2, DATACOM DB, IDEAL, COBOL II, to develop, maintain or enhance business systems & Client-Server Applications. TELON is a must experience.

LAN/WAN Administrator - with at least 5 years experience in Data Circuits Installation, Maintenance & Administration. Knowledge of the following is required: Novell, Gateways, Servers, Routers, Hubs, Token-Ring, HP OpenView.

UNIX Administrator - solid experience with HP/Unix and/or AIX. Knowledge of TCP/IP, Oracle, Windows NT. Experience with Kerberos & Eco Tools a plus.

ANALYSTS - with solid experience in Client-Server Applications in Oracle and PowerBuilder.

ADW Specialists - with solid experience with Knowledgeware products and tools.

SAP Specialists - with 2 to 3 years experience in SAP software applications development.

Please send ASAP or preferably FAX a complete resume to:
Al-Khaleej Computers-HRD, P.O. Box 2062, Al-Khobar 31952, Saudi Arabia Fax: (966) 3-894-6432

APS • DB2 • CICS

"Leaders in business, industry and government are mastering the strategic use of information systems. ACI has become an invaluable resource to those leaders by building quality systems that help them achieve their goals."

Automated Concepts Incorporated (ACI), the premier provider of quality software development to Fortune 1000 companies, is seeking Mainframe professionals with expertise in APS, DB2 and CICS. Positions are available in our Chicago and New York regions.

We offer an excellent salary and impressive benefits including **RELOCATION ASSISTANCE**. For Chicago openings, call (312) 380-4200 or send resume to: **ACI, 8770 W. Bryn Mawr Ave., Dept. CW26, Chicago, IL 60631. Fax: (312) 380-4227.** For New York openings, call (212) 391-2100 or send resume to: **ACI, 1500 Broadway, 30th Fl., Attn: CW26, New York, NY 10036, Fax: (212) 391-1720.** EOE

aci automated concepts incorporated

CONSULTANTS SHOULD CONSULT
MIMI
IMMEDIATE CONTRACTS
Please send resume & call:
Mimi Simon Assoc.
(212) 406-1705
FAX (212) 406-1769

IE/IEF

MTW CONSULTING

We are responsible for the delivery of several multi year, full life cycle IE/IEF projects. Please contact MTW if your background includes any:
* Project Management
* Any of the IE Stages ISP thru Production
* IEF Database or Technical Support

We are dedicated to IE project engagements, and have been a TI IEF Alliance Partner since 1990.

2300 Main St. #900, Kansas City, MO 64108
(816) 421-6004 • (800) 880-9680
Fax (816) 471-7918

Now you have a better way to recruit university and college students planning computer careers:

Computerworld's eighth annual Campus Recruitment Edition

Issue Date: October 31, 1995
Close September 15, 1995

If you recruit top computer career students on America's campuses, your message in this special issue will target more of them than any other newspaper or magazine!

Now you can recruit computer talent on campus without leaving your office!

That's because 100,000 copies of this special issue will be distributed to America's best and brightest students enrolled in Information Systems (IS), Computer Science, Computer Engineering, Electrical Engineering, and just about any other computer-related curricula.

Finally you can cost-effectively reach the quality and quantity of students you need!

And you can do it with just one ad in ***Computerworld's Campus Recruitment Edition!*** For a rate card reflecting complete campus distribution, call John Corrigan at 800/343-6474 (in MA, 508/879-0700). But hurry...
This issue closes September 15, 1995.

Planned Editorial Features:
(subject to revision)

- The best places to work in IS
- Companies where computer career students want to work.
- Information Systems salaries from Computerworld's annual survey with the Association for Systems Management
- And much more!



ANNUAL CAMPUS RECRUITMENT EDITION EIGHTH
8th ANNUAL



"...Computerworld Direct Response Cards consistently generate the highest profits of any deck we've tried."

- Mary Cooper
Vice President
cfSOFTWARE, Inc.

A software developer based in Chicago, cfSOFTWARE hos been providing communications salutions to computer professionals in the IBM ond compatible oreno for over a decade. Becouse *Computerworld* appeals ta o large base of both moinfrome ond PC professionals, Vice President Mary Cooper just recently exponded the compony's *Computerworld Direct Response Card* odvertising to include all three of their cammunicatians products.

"To generote sales for Across the Boards, o communications toolkit for develaping coaperative applications, ond pcMAINFRAME, o generalized micro-to-mainfrome file transfer system, cfSOFTWARE hos been odvertising in *Computerworld Direct Response Cards* almast fram the very start. Naw, bosed on our past success, we've olso storted to odvertise pc2POWER, our newest file transfer system. Since oll of our products facilitate mainframe-to-micro communicotion, we need to reach IS monagers ond technical suppart prafessianals on the mainframe side os well os end users on the PC side. Thot's why *Computerworld Direct Response Cords*, with their large oudience of buyers mast apt to need our products, are ane af our primory advertising vehicles.

"Clearly, *Computerworld Direct Response Cards* take the 'hit ar miss' out of advertising by qualifying our audience for us. We call it our high-prafile deck becouse we nat only get high visibility ond o high rote of response but also convert o high valume of leads into sales. With their excellent cost per lead, *Computerworld Direct Response Cords* consistently generate the highest profits of any deck we've tried.

"In fact, we con olways tell when our *Computerworld Direct Response Card* advertising hits becouse of the sudden surge in soles octivity. Business reolly starts happing with mare phone calls and more mail. It's o real marale builder! But most importantly, every time we odvertise in *Computerworld Direct Response Cards* we receive well aver 100 leads. Sometimes we even get responses six months later, so we know *Computerworld Direct Response Cards* have o long shelf life that gives cfSOFTWARE valuable exposure for building oworeness ond share af mind over the long term.

"While reasonable rates for calor ond multiple insertions odd considerable oppeal, the large quantities of quality leads generated by every card we run is our key incentive for stepping up cfSOFTWARE's advertising schedule in *Computerworld Direct Response Cards.*"

Computerworld Direct Response Cards give yau a cast-effective way ta reach o powerful buying audience af over 139,000 computer professionals in the U.S. They're working for cfSOFTWARE - ond they can work for you. Coll Norma Tamburrino, Notional Account Manoger, Computerworld Direct Response Cords, ot 201/587-8278 to reserve your space today.



COMPUTERWORLD
DIRECT RESPONSE CARDS
Where you get direct access to quality sales leads.

1 800 343-6474
IN MA 508 879-0700 x247

CURRENCY CONFUSION

Dealing with foreign currencies is a big hurdle when purchasing equipment for global operations. Currency fluctuations can't be controlled, but they can be managed.

By Thomas J. Howard

Differences in languages and laws, lengths and weights, time zones and customs are all concerns for those involved in international business. But of the lot, dealing with foreign currency exchange rates causes the greatest confusion and frustration in the global purchasing environment.

Computer software and hardware costs heavily depend on the exchange rate between the U.S. dollar and the local currency, making even the savviest procurement manager want to scream. But buyers who learn to make the most of the fluctuations will get a better deal for the computing power they acquire.

As with most purchases, both in the U.S. and abroad, getting the best price shouldn't be your only goal. You should expect vendors to provide products and services where and when you need them. Moreover, the quality of the vendor's service and support should be excellent.

If you're new at this game, you'll soon learn that there are things you can control and things you can't (see story at right). Overall, you're generally at the mercy of exchange rate fluctuations, but it's important to watch them so you can maintain some sense of management.

Grasping it all

To understand how confusing it can get, let's assume you have a branch office in Mexico and a central purchasing agreement with a PC vendor in the U.S. The prices listed in the agreement are in U.S. dollars.

If the arrangement was in effect in December 1994, your costs have changed dramatically. A $1,500 PC cost 4,575 pesos on Dec. 20. On Dec. 22, the peso was devaluated 15% by the Mexican government. This means the same PC then cost 5,261 pesos. One month later, it cost 7,800 pesos. That's a 70% decrease in the value of the peso relative to the dollar. Now your Mexican branch office must come up with 70% more pesos to buy that PC.

As you'll find, procuring equipment in a foreign land doesn't have to be all that bad. Managed properly, currency exchange fluctuations can be one less thing to worry about. The trick is to spend a little time learning how to make currency work for you, giving you more time to worry about issues that really matter — the quality, reliability, performance and scalability of your new systems. ■

Howard is a senior vice president, international at Tricord Systems, Inc. in Plymouth, Minn. He is also author of *Global Expansion in the Information Age: Big Planet, Small World* published by Van Nostrand Reinhold.

What you're up against

When buying equipment for overseas offices, watch currency fluctuations to lessen the exchange impact. The following example shows the difference a few years can make in foreign prices

Exchange rates indicate that it took 123.5 yen to buy one U.S. dollar on Jan. 20, 1982, and 99.5 yen on Jan. 20, 1995.

	Japanese yen	German deutsche mark	Mexican peso
Jan. 20, 1993	124.9	1.60	3.08
Jan. 20, 1995	99.5	1.51	5.04

A $1,500 PC would cost the following in those currencies based on the above exchange rates:

Jan. 20, 1993	187,350	2,400	4,620
Jan. 20, 1995	149,250	2,265	7,560

A $1,500 PC purchased in Japan today would cost 24.1% less yen than it would have cost three years ago. In Mexico, that same purchase would require 63.7% more pesos.

Make the most of YOUR MONEY

Any global enterprise must deal with currency issues. Governments will fix duty rates, carriers will set freight charges, and brokers will establish fees for clearing shipments. Currency is black magic. You can't control it, but you can manage it. Here's how:

- Purchase and use your computing products in the same country when possible. If you have a central purchasing agreement with a global vendor, have the product delivered and paid for locally. This may limit your exposure to the fluctuations in exchange rates between the local currency and the dollar.

  Your vendor's cost, however, is probably based in another currency. You may buy and accept delivery of PCs in Belgium but their cost base is probably not in Belgian francs. In this case, share the risk with the vendor. Provide a mechanism through which you can change prices quarterly if the relevant exchange rate fluctuates more than 10%.

- If you buy on a case-by-case basis without a central purchasing agreement, watch the exchange rates to see if there are trends to exploit. If prices change slowly in a country whose currency is weak, take advantage. Convert your strong currency into the weaker one and buy in that country.

- Gambling on currency rate fluctuations over an extended period of time is risky. Don't try this at home. Experts, primarily banks, can minimize your risk, so get your financial people to hedge currency fluctuations.

- Adjust your purchasing policies and procedures regularly to reflect changes in the global purchasing environment. In other words, monitor exchange rates and keep tabs on trade relations among nations in which you do business. The General Agreement on Tariffs and Trade and the North American Free Trade Agreement are examples of trade initiatives that will impact not only trade barriers but also currency exchange rates.

— Thomas J. Howard

Networking Management Tools

FILEAUDITOR TELLS ALL!

WHO GOT INTO WHAT FILES, WHEN?

FileAuditor enhances your network security by...

- Tracking file and directory activity on the network
- Having proactive network security with NUMAuto or NLMerlin
- Denying access to specific files
- Generating custom reports

If you need enhanced network security

Call: 1-800-333-8698

FAX: (602) 545-0008

Knozall Systems, 375 E. Elliot Rd, #10 Chandler, AZ 85225

A Division of Tangram Enterprise Solutions

Outsourcing / Remote Computing

Your best choice for mainframe computing services

REMOTE COMPUTING

Extensive Software Library

Telenet Tymnet

Advantis Compuserve

MVS/ESA IMS/DBDC

VM/ESA CICS SAS

VSE/ESA TSO DB2

Extrsordinary Customer Service

Migration Management

708-574-3636

New England 617-595-6000

815 Commerce Drive, Oak Brook, IL 60521

FANEUIL SYSTEMS

Computer Presentations

Three for the show.

An Inc. 500 Company

NEW!



BEST SELLER

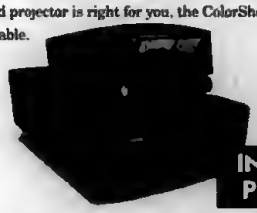
Affordable color! Our most popular product just got even better. Better wall-sized true-color projection at the same unbeatable price. The BOXLIGHT ColorShow 1200 is our best seller for a good reason - value!

BOXLIGHT 1200. $2,299

- 24,389 vibrant colors
- Universal PC and Mac compatibility
- Compact, portable design
- FREE remote control and cables
- Brightest color at any price
- Now with faster mouse response!

COLORSHOW 2000. $3,999

The ONLY "all-in-one" LCD data projector priced under $4,000 is now available exclusively from BOXLIGHT! The sleek, compact design offers unobtrusive operation in the boardroom and folds for ultimate portability. The bright STN technology delivers rich brilliant color from your PC or Mac. If the convenience and performance of an integrated projector is right for you, the ColorShow 2000 is unbeatable.



INTRO PRICE

- Sleek, compact and stylish design
- Compatible with PC or Mac
- Less than 20 lbs. travel weight
- Includes free remote control
- Optional Computer Control Wand



SPECIAL OFFER

Active-matrix Color at a passive matrix price! TFT 24-bit processing for photo-realistic color in an under $3,000 panel! Fast-changing meetings require the speed of active-matrix technology. BOXLIGHT's best-selling ProColor is the choice of hundreds of our Fortune 1000, Government and Higher Education customers, like YOU!

PROCOLOR 1300. $2,999

- 16.8 million color palette
- Lightweight, reliable and rugged design
- PC/Mac compatible upgradeable to video
- Multimedia model 1500 only $3,799!

BOXLIGHT: Your direct source for all the bright answers.

- More than 50 models in stock
- Instant availability
- Overnight shipping
- 30-day guarantee and extended warranties
- Expert technical support

ANNIVERSARY

No one else offers the one-stop shopping...the selection... the value...the immediate delivery... and the knowledgeable service and support you get from the projection panel experts.

BOXLIGHT™ CORPORATION

17771 Fjord Dr. N.E., Poulsbo, WA 98370 • (360)779-7001

Payment: VISA, MasterCard, American Express, COD and Purchase Orders (some restrictions). Leasing and rental options available. 30-day Money Back Guarantee.

Call today 1-800-762-5757 Government Sales 1-800-827-4566

The Inc. 500 logo is a registered trademark of Goldhirsh Group, Inc.

Networking Hardware

SUFFERING SERVER SQUEEZE?





MasterConsole eliminates keyboard and monitor clutter!

Managing multiple servers? MasterConsole can give you rock solid, reliable control of 2 to 64 PCs from a single keyboard, monitor and mouse. So give yourself some breathing room. Call today for our free information kit.

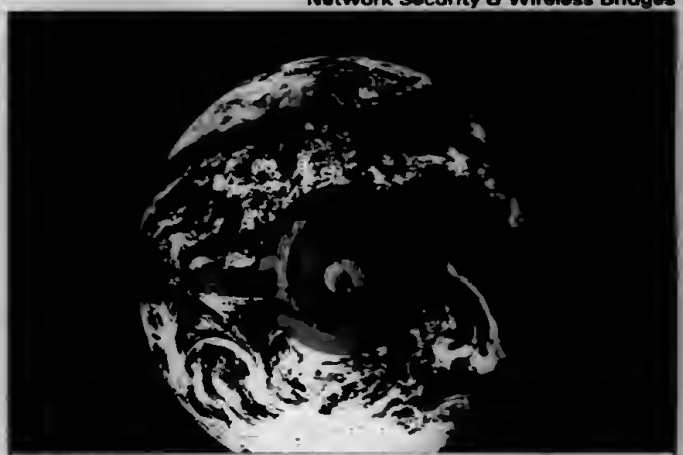


FREE! Call (908) 874-4072, Ext.32, today for our information kit!

MasterConsole®

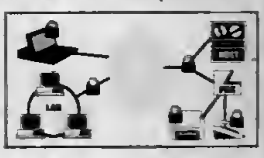
Raritan Computer, Inc.
10-1 Ilene Court, Belle Mead, NJ 08502
FAX (908) 874-5274

Network Security & Wireless Bridges



Cylink has the world locked up.

You *can* secure your information globally. You just need the right security partner. Only Cylink has spent the last ten years building a support organization in over 80 countries—working successfully with local governments, customs, and communications infrastructures. We can secure everything from applications on a laptop to global wide-area networks, from telephones to high-speed data links. We secure information for most of the world's money center banks. Fortune 500 companies, and government, police, and military organizations. Because of our experience, it's easier than you think to keep your information safe. Cylink Corporation, 910 Hermosa Court, Sunnyvale, California, USA, 94086. Telephone: 408-735-5800, FAX: 408-720-8294, Toll-free (USA): 800-533-3958. Worldwide sales & support.



FAX INFO: 800-833-9137 ext. 63.

Cylink, Ltd., Hampshire—TEL: +44-256-841010 • FAX: +44-256-841158
Cylink Corporation—TEL: +65-336-6677 • FAX: +65-336-1870
© 1994 Cylink Corporation. Cylink is a registered trademark of Cylink Corporation.

CYLINK

MARKETPLACE

Connectivity Software

TCP/IP Applications For Windows.

Network Your PC To The World With Chameleon.



BEST VALUE
Chameleon offers more applications than any other product, providing a comprehensive Windows solution for TCP/IP networking.

SEVEN INTEGRATED SUITES
Terminal emulation, e-mail, file and printer sharing, remote access, network utilities, administration tools, and an easy point-and-click interface into the Internet.

SEAMLESS ACCESS TO OTHER HOST SYSTEMS More applications are included that allow you to access information on Unix mainframes, minicomputers, PC-based LANs and WANs, and the Internet.

OFFICE, HOME, AND REMOTE NETWORK ACCESS
Connect to your network and the Internet via LAN or dialup access with one easy-to-use software package.

Chameleon includes WinSock TCP/IP and is 100% DLL. It requires only 6KB memory and 5 minutes to install.

APPLICATIONS INCLUDED:
Terminal Emulation
- Telnet: VT100, VT200, TVI, TN3270, TN5250
- Visual Script Editor & Player

File Transfer
- FTP Client & Server
- TFTP

File & Printer Sharing
- NFS Client & Server
- LPR/LPD

Electronic Mail
- SMTP Mail with MIME
- Phone Tag
- IBM PROFS
- POP2, POP3, SMTP

Internet Access
- Gopher
- Newsreader
- Whois

Network Utilities
- Ping
- Finger
- Diagnostic Center/Trace Agent
- DNS Client & Server

WinSock TCP/IP
- 100% DLL TCP/IP Stack
- Windows install and setup
- LAN: Ethernet, Token Ring
- Dialup: SLIP, CSLIP, PPP & ISDN

MICROSOFT® WINDOWS™ COMPATIBLE · yes NetWare Tested and Approved · Sept 1994 · Sept 1994 · Sept 1994

© 1994 NetManage Inc. 10725 North De Anza Boulevard Cupertino, California 95014 U.S.A.
Fax: (408) 257-6405 Specifications are subject to change without notice. All trademarks are property of their respective companies.

NETMANAGE™
(408) 973-7171
e-mail: sales@netmanage.com
World Wide Web: www.netmanage.com

Network Management ► See Us At CeBIT Booth # M9-M10

Supports any [illegible] of PC, [illegible] and Sun computers; use any platform's peripherals to access any type of computer in the system.

- **Multimedia**
  Every user has full multimedia capabilities; supports keyboard, mouse, video, speakers, microphone and high speed serial port.



AUTOBOOT
COMMANDER 4XP™

Cybex Corporation
4912 Research Drive • Huntsville, AL 35805 USA
(205) 430-4000 • FAX (205) 430-4030

CYBEX™

[illegible] is a trademark of Sun [illegible] Inc. [illegible] is a trademark of Cybex Corporation.

Buy / Sell /Lease

IBM Systems • Peripherals • Parts & Service

- RISC System/6000®
- Workstations
- Parts & Features
- AS/400®
- Novell Networking
- Sun & Dec
- Personal Computers
- Data Communications
- UPS Systems
- Peripherals & Upgrades
- System 36 Conversions
- AutoCad

NEW & USED IN STOCK
Complete Technical Center [illegible] Stock Parts & Features for RISC

Authorized Distributors for: **Seagate • Xerox Kingston • Cal Comp Motorola • UDS/Codex Decision Data Products**

8 Nationwide Locations

A Publicly Traded Company NASDAQ: MKPL

Computer Marketplace prides itself on being your one call computer hardware solution.

COMPUTER MARKETPLACE
800-858-1144
TEL (909) 735-2162 • FAX (909) 735-5717
1490 Railroad Street • Corona, CA 91720

IBM Trademark CBE

MARKETPLACE

Outsourcing / Remote Computing

ALICOMP, INC.

The "Boutique" of the Computer Services World

Outsourcing Remote Computing

VM, MVS, VSE

Two State of the Art Locations:

ALICOMP / CBS

20,000 sq. ft. Manhattan complex 105,000 sq. ft. Secaucus, NJ complex

"Our Platform is Excellence"

Serving Clients Since 1980

(212) 886-3600 • (800) 274-5556

Outsourcing

If Outsourcing is your objective...

You can maximize your information technology investment by outsourcing part – or all – of your IS operation. Whether it's a transitional or long-term total services partnership, American Software's the right place to rightsize.

Even software developers enjoy the cost and time-saving benefits of outsourcing with us. Call today and we'll tell you why.

®The Outsourcing Group
A Unit of American Software USA
470 E. Paces Ferry Road
Atlanta, GA 30305
404-264-5770

Large Systems Computers & Peripherals

IBM
- ES/9000
- SERIES/1
- AS/400
- RS/6000
- SYSTEM/88
- Point Of Sale

...and more!

New & Used
- Computers
- Peripherals
- Upgrades

Buy • Sell • Rent • Lease

SPECTRA
(800) 745-1233
(714) 970-7000 • (714) 970-7095 Fax

Anaheim Corporate Center
5101 E. La Palma Ave., Second Floor
Anaheim, CA 92807

amdahl
Cisco
Concurrent
Data General
digital
Hitachi
Hewlett Packard
Memorex-Telex
Prime
Silicon Graphics
Stratus
Sun
Tandem
Texas Instruments
UNISYS
XEROX

Buy / Sell / Lease

WE BUY

Data General Aviion
Data General MV
Data South
Data Products
RS/6000
HP 9000
SUN
PCs/Workstations
and we sell it too!

(617) 982-9664

Trading

Outsourcing / Remote Computing

Outsourcing/Remote Computing

CONSULTEC INC

Whether its Transitional or Long Term Outsourcing, we invite you to see why Consultec is

The Logical Choice

MVS/ESA-CICS-TSO-DB2-IMS

Contact: Carey Gibson
1-800-358-2381 ext.330
in GA. 404-594-7799
9040 Roswell Road Atlanta, GA 30350

Attention IS Professionals

Find out where the money is!
Computerworld's 1994/1995 Salary Survey disk is just what you need to get an inside look at what professionals are getting paid.
Get the facts on
- Salaries in 28 IS specific job titles
- Salaries in 21 industries
- Salaries by geographic regions - not published anywhere else

Call to order ***Computerworld's Salary Survey*** on disk today.

ONLY $99



Call toll-free 1-800-495-0157, ext.10

Systems & Services

Dempsey: Where IBM® Quality is Second Nature!

- AS/400
- INDUSTRIAL PC
- RS/6000
- SYSTEM/36
- SERIES/1
- 9370
- ES/9000
- PS/2 & VP

Sales & Rentals
- Processors
- Peripherals
- Upgrades

For pretested equipment, flexible financing, configuration planning, technical support and overnight shipping call.

Dempsey BUSINESS SYSTEMS
18377 Beach Blvd. Suite 323 • Huntington Beach, CA 92648
(714) 847-8486 • FAX (714) 847-3149

IBM Authorized Dealer Products Integrator

IBM is a registered trademark of International Business Machines Corporation

(800) 888-2000

MARKETPLACE

Solutions Directory

401(k) ADMINISTRATION

DELTA DATA SOFTWARE, INC.....
(800) 451-9166
Defined contribution administration software for the plan sponsor. Interfaces with payroll to administer 401K, ESOP, thrift, and profit sharing plans. Daily or periodic processing, distributions, loans, ADP/ACP testing. User defined statements, voice response. Runs on AS/400 and PC.

ACCOUNTING

~ M • A • S 90 EVOLUTION/2 Accounting Software at Discount Prices?
Pay ***DISCOUNTED*** prices for the premier accounting solution. Industrial strength G/L, A/P, A/R, Payroll (with multiple city/state taxation), J/C, P/Q, Sales Order, Point of Sale, Inv Mgmt, Time & Billing, many others. Dos/Windows/UNIX platforms supported.
CORLOR Development, Inc. (505) 281-7151

APPLICATIONS CONVERSION

AUTOMATED CONVERSION SPECIALISTS

DOS to MVS	HONEYWELL to IBM
MACRO to COMMAND	CSP to COBOL/CICS
RPG to COBOL	COBOL to COBOL II
PL/1 to COBOL	CENTURY EXPANSION

Other Platform/Language Conversions
BELCASTRO COMPUTER SERVICES, INC.
800-521-2661 216-652-1628

APPLICATIONS DEVELOPMENT

APPLICATION DEVELOPER'S TOOLBOX
See proceeding page in Marketplace

Tired of maintaining your legacy applications?
LPC. . . . . (800) 634-5377

BUSINESS CONSULTING

KRESIC & MAZZONE INTERNATIONAL
Twenty years experience in international and domestic technology transactions, advising on **hardware and software agreements, OEM, strategic alliances, joint development projects and protection, use, licensing and transfer of intellectual property.**
For more information call (203) 431-9204 or fax (203) 431-1945.

C++

C++ and Object Technology Training
5-day on-site seminars on C++, Visual C++, Borland C++, OOA/OOD, Visual Basic, and C. We customize our courses to your needs. Contact us today for course outlines and pricing.
DEITEL & ASSOCIATES
deitel@world.std.com
Phone: (508) 877-0273 FAX: (508) 788-0937

CLIENT SERVER DEVELOPERS

Re-Engineer NOW!!!
Let our highly motivated professionals help your corporation make the successful transition from your existing mission critical applications into object-oriented client/server systems. Powerbuilder, C/C++, Visual Basic, Sybase/Oracle/Informix, Imaging, Wireless, ISP.
Innovative Information Technologies, Inc.
1-800-352-2797

Millennium Computer Corp. "Quality Solutions" On Schedule, Within Budget . . . . (716) 248-0510

COMPUTER/TEL INTEGRATION

Computer/Telephone Integration
Consulting & Design
Expert guidance for the medium to large call center environment. ANI/DNIS routing - Call/Data-screen synchronization - Caller Profile call routing. Functional Specifications-Design-Documentation.
Get it right the 1st time!
INSIGHT SERVICES 1-800-677-5024

CONTRACT PROGRAMMING

PC programming, DOS/WINDOWS $30/hr. Courseware Appl. (612) 854-8909 Fax (612) 854-1868

CONSULTING

BRIDGTON INC 800-305-6478 404-518-4289

OPERATING SYSTEMS	DATABASE
UNIX	SYBASE
MS WINDOWS	ORACLE
MS-DOS	DB2
OS/2	XDB
MVS	
LANGUAGES	EQUIPMENT
C,C++	IBM RS 6000
COBOL II	IBM PC (COMPATIBLE)
POWERBUILDER	IBM MAINFRAME
VISUAL BASIC/VISUAL C++	DATA GENERAL
REXX	HP 9000
CICS/DB2/VSAM	
FOXPRO, CLIPPER	
CASE TOOLS	SERVICES
ADW 1 6/2 7	CONSULTING
ADW CWS GUI	TRAINING
OBJECTVIEW	OUTSOURCING
IEF	

SAVE 50%-70% ON PROGRAMMING
While using some of the most sophisticated programmers in the world. All customer contact handled in the U.S.
- **Client Server**
- **New Application Development**
- **Updating & Porting to New Platforms**

Typhoon Software, Inc.
800-499-0888

DATA RECOVERY

RANDOMEX Data Recovery Servise
Hard Drives · Tapes · Floppies · Disk Packs
Crashes/Power Failures/Viruses/Fire
Average Turnaround 72 Hours
98% Success Rate On Recoverable Data
14 Years Experience * 23 Operating Systems
800-726-3669 (Long Beach, CA)
800-466-0893 (Boston, MA)

DATA WAREHOUSING

The Data Warehouse Experts
Looking for a company with years of experience in true Data Warehouse implementation? Look no further! Let Solveris help unlock the power of your information system!
Solveris Inc.
(800)-999-4829

Will your warehouse misfire from misinformation?
The Integrity Data Re-engineering Tool transforms legacy data, saddled by account and department orientations, into consolidated views of customers and the business. Request paper detailing 5 legacy data contaminants you will encounter & stories on firms solving their data migration problems. 617-338-0300

EDUCATION & TRAINING

Information Security Training & Publications
CSI Membership includes: monthly newsletter, buyers guide, journal, training discounts, hotline, networking, more. Seminars, conferences: June Network Security Conference in New Orleans. For free sample newsletter and information:
Fax (415) 905-2218 CSI 600 Harrison St SF, CA 94107 phone (415) 905-2626 e-mail prapalus@rmh.com

Visual Basic, C++, OOA-OOD,ORACLE
Texas Software. . . . . (800) 252-7007

ELECTRONIC DOCUMENTATION

Assistance in Standard Generalized Markup Language. Concept development, requirements, documentation analysis, document type definitions, training, technical architecture, conversion, document viewing. Automate document preparation. Reuse content in new ways.
Wayfarer Inc. 800-622-5315

ELECT. DATA INTERCHANGE

EDI software, consulting, & integration
Next EDition, Inc. 14+ yrs exp.....(216) 498-0602

FAX-COMPUTER INTEGRATION

ABConsultants 1-800-982-3715
Planning a fax-on-demand, fax broadcasting or fax server system? Get professional help in:
- Analyzing needs & planning the system
- Selecting the best system for superior customer service & maximum savings
- Implementation, training and startup

Get information by fax at 408-243-2275

I/T CONSULTING

MAINFRAME SOFTWARE SUPPORT SERVICES. OPERATING SYSTEM MIGRATION. PERFORMANCE TUNING. DATABASE. PROGRAM PRODUCT SUPPORT. DATA MANAGEMENT. CICS, DB2, IMS, NCP, VTAM AND MANAGEMENT CONSULTING.

CAMERON OF ATLANTA, INC. (800) 331-7635

OFFSHORE SOFTWARE DEV.

COSTA RICA - "A BETTER WAY"
Low-cost, hi-quality offshore programming. Central Time Zone. 3 hour flight from USA. Satellite Links. Oracle, Visual Basic, Powerbuilder, Sybase, C++, COBOL, AS400.
Hestair, Houston . . . . . (800) 448-7277

Hexaware Technologies - A Blue Chip Resume:
- *Client/Server* technology focus
  - **Oracle, Sybase**
  - **Powerbuilder, Uniface, Visual Basic**
- Complete Turnkey responsibility
- Virtual 64 kbps data link from your office to India
- State-of-the-art software development center in India
- Large pool of quality software talent
- International quality standards
- Success stories in US/Middle East/India
- Joint Venture option

Tel: (609) 951-9195; Fax (609) 951-9636;
Partner for Success
Hexaware Technologies, Inc.
Princeton • Bombay • Bahrain • Dammam

Serving the Northwest USA
- Providers of quality software development

Options for Joint Venture Services

New Development	Re-engineering
Migration	Client-Server/PC/RDBMS
Testing/QA	Product Enhancement

LINCROSS SOFTWARE SYSTEMS, INC.
(206) 236-5847
INDIA • SINGAPORE

OUTSOURCING

ALICOMP and CBS Data Services, in its business alliance, offers the highest level of technical, operational, and managerial expertise within a single mandate: loyalty and the highest quality computer services with flexible pricing to our client/partners.
ALICOMP/CBS
(800) 274-5556
(See Our Ad in the MarketPlace)

Outsourcing/Remote Computing
IBM, MVS/ESA
Transitional Outsourcing
Specializing in high online transaction environments, Multiple mainframes, Reasonable prices
Consultec, Inc.
Contact: Carey Gibson
(800) 358-2381 ext. 330

ISO 9001 CERTIFIED OFF-SHORE/ ON-SITE SOFTWARE SERVICES
Substantial cost savings on Development, Maintenance, Conversion, Rightsizing using Indian facility with in-house IBM 9000, AS/400, RS 6000, SUN and CICS, DB2, IMS, COBOL, RPG, SYNON, Oracle, Sybase, Visual Basic, Powerbuilder, Uniface, C++.
D Square Software, Inc.
Tel: (908) 632-2688 Fax: (908) 632-2692

FANEUIL SYSTEMS provides mainframe based Outsourcing and Remote Computing Services for well over a decade. Our reputation for providing high quality services in a flexible and cost effective manner is undisputed in the industry. **Join** the many others who have already made the **right choice, call FANEUIL SYSTEMS at (708) 574-3636. (See Our Ad in the Marketplace Section)**

FINANCIAL TECHNOLOGIES
COMPUTER SERVICES DIVISION
(703) 631-4401
OUTSOURCING - REMOTE PROCESSING
Multiple IBM ES9000 Mainframes
MVS/ESA VM/ESA
Current Software Releases
7 days/week, 24 hours/day
Quality Service - Competitive Pricing

MCRB Service Bureau, Inc.
3090 Computer Services . . . . . .(800) 941-MCRB

PC SOLUTIONS

Micro Focus COBOL, Dialog System, Panels2 solutions. Next EDition, Inc.....(216) 498-0602

PURCHASING SOFTWARE

Commerce Software, Inc. (PurchaseSQL™)
Elmsford, NY . . . . . (800) 447-7172

REMOTE COMPUTING

ALICOMP provides short and long term mainframe remote computing services to companies who require VM, VSE, and/or MVS. Pricing and contracts are tailored to the unique requirements of each client. Client intimacy is our hallmark.
ALICOMP, Inc
(800) 274-5556 (212) 886-3600
(See Our Ad in the MarketPlace)

FANEUIL SYSTEMS provides mainframe based Outsourcing and Remote Computing Services for well over a decade. Our reputation for providing high quality services in a flexible and cost effective manner is undisputed in the industry. **Join** the many others who have already made the **right choice, call FANEUIL SYSTEMS at (708) 574-3636. (See Our Ad in the Marketplace Section)**

RIGHTSIZING

MCRB Service Bureau, Inc.
3090 Computer Services . . . . . (800) 941-MCRB

SOFTWARE REENGINEERING

Reuse Your Existing Software Assets
- Computer language translation and migration reengineering services converting into C, C++, Ada and COBOL
- Services guaranteed for functionality, maintainability, price, delivery date
- Language and platform independent

Alydaar Software Corporation:
(504) 845-3322

SOFTWARE REUSE

RPM ™ **"NEW"**
Reuse Process Manager ™
The One and Only Process Manager That Combines OT, C/S and Reuse
A windows-based process manager tool with a fully customizable reuse-based, Object-oriented OO methodology for defining and managing the development of C/S applications.
Developed by Dr. Carma McClure
Extended Intelligence, Inc.
(312) 346-5245 x360

SOLUTIONS DIRECTORY

Computerworld, Inc.

CEO/President Gary J. Beach | **Executive Vice President** Steven F. West | **Senior Vice President/Finance** Matthew C. Smith | **Vice President/Human Resources** Susan C. Perry | **Executive Assistant to the CEO/President** Karen E. Elliott

Computerworld

An IDG Company: The World's Leader in Information Services on Information Technology

Publisher
Kevin McPherson

Computerworld Headquarters: 375 Cochituate Road, P.O. Box 9171, Framingham, MA 01701-9171 Phone: 508-879-0700, FAX: 508-875-4394

Vice-President Editorial Bill Laberis | **Vice-President Sales/Associate Publisher** David Peterson | **Vice-President Consumer Marketing** Gail Odenwald

PUBLISHER'S OFFICE: *Assistant to the Publisher* Lois Bennett **SALES CLASSIFIED** *Classified Operations Director* Cynthia Delany **MARKETING:** *Director, Marketing Communications*, Mary Doyle, *Account Manager, Marketing Communications*, Elizabeth Phillips *Manager, Trade Show & Conventions* Audrey Shohan, *Marketing Communications Project Manager*, Susan Thaxter *Administrative Assistant*, Patty White **CIRCULATION:** *Director of Circulation Management*, Maureen Burke **PRODUCTION**, *Production Director*, Christopher P. Cronin, *Production Manager*, Beverly Wolff **DISTRIBUTION**, *Distribution Manager*, Bob Wescott, *Traffic Manager* Pat Walker

Sales Offices

Associate Publisher/Vice-President/Sales
David Peterson
Computerworld Headquarters: 375 Cochituate Road, P.O. Box 9171 Framingham, MA 01701-9171 Phone: 508-879-0700, FAX: 508-879-0446

Northeast
Regional Vice President: Sherry Driscoll, Senior District Managers: Bill Cadigan, John Watts, Sales Office Coordinator: Tammy Grossmeier, Sales Assistants: Laura Holliday, Barbara Shuman, 470 Totten Pond Rd., 5th Floor, Waltham, MA 02154 (508) 879-0700 FAX: (617) 890-2009 TDD: (800) 428-8244

Mid-Atlantic
Senior District Managers: Fred LoSapio, Vicki Gomm, Rich Moldon, Sales Assistants: Susan Kinnar, Jean DeBarobbs, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090 FAX: (201) 712-9786 TDD: (800) 368-0288

Southeast
Regional Vice President: Bernie Hockswender, Sales Assistant: Jennifer Patterwaide, 3675 Crestwood Parkway, Suite 400, Duluth, GA 30136 (404) 931-0104 FAX: (404) 931-0106 TDD: (800) 440-4074

Midwest
Senior District Manager: Sharon R. O'Brien, Sales Assistant: Denice Richards, 900 N. Michigan Avenue, Suite 1400 Chicago, IL 60611 (312) 214-3000 FAX: (312) 214-4962

Southwest
Senior District Manager: Damon Ford, Sales Assistant: Brenda Shipman, 14651 Dallas Parkway, Suite 304, Dallas, TX 75240 (214) 233-9582 FAX: (214) 385-1603 TDD: (800) 822-4919

Western Editorial
Vice President Western Advertising Sales: Richard Espinoza, Senior District Managers: Ernie Chamberlain, Kaye Sharbrough, Linda Holbrook, District Managers: Christine Curry, Elizabeth Cooper, Lisa Kowalski, West Coast Operations Manager: Letricia Lehane, Sales Associates: Denise Hui, Emily Gurian, Shannon Dempsey, Denise Garcia, Andrea Zurek, Jim Schott, Colleen Molnar 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555 FAX: (415) 347-8312 TDD: (800) 800-3170

Western Advertising
District Manager: Nancy Cox, Sales Associate: Rachel Gillis Swartz, 2171 Campus Drive, Suite 300, Irvine, CA 92715 (714) 250-3942 FAX: (714) 476-8734

Advertising Production
Display Advertising Production Manager: Paula Wright, Display Advertising Coordinators: Lisa Tanner, Peggy Hennessy, Gregg Pinsky (508) 879-0700 FAX: (508) 879-0446

Custom Publications
Boston: Vice President/Larry Craven, Director of Publishing Services/Carolyn Swarck, Sales Assistant/Heidi Brantley, 375 Cochituate Road, Box 9171 Framingham, MA 01701-9171 (508) 879-0700 FAX: (508) 879-0446
San Francisco: West Coast Director/Elayne B. Offenbach, Sales Associate/Nikki Wilson, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555 FAX: (415) 347-8312

Client/Server Journal
Associate Publisher: James Hussey, 375 Cochituate Rd., Box 9171 Framingham, MA 01701-9171 (508) 879-0700 FAX: (508) 872-2364
East: John Watts, 470 Totten Pond Rd., 5th Floor, Waltham, MA 02154, (508) 879-0700 FAX (617) 890-2009
West: Kaye Sharbrough, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555 FAX: (415) 347-8312

Marketplace Advertising
Manager: Michelle Reeves, **New England** Account Executive/Susan Cardoza, **South-Atlantic/Midwest** Account Executive/Kevin Gasper, **Southwest** Account Executive/Claude Garbarino, Marketing Communications Manager/Karen Lesko, Solutions Directory/Nancy Whittaker, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474 FAX: (508) 820-8041

Recruitment Advertising Sales Offices
Vice President/Recruitment Advertising/John Corrigan, Marketing Director/Doreen E. Hulecky, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474
New England: Regional Manager/Nancy Perrotti, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474, Account Executive/Nancy Mack, (800) 343-8474
Mid-Atlantic: Regional Manager/Marty Finn, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090, Account Executive/Caryn Dietz, (800) 342-6474 TDD: (800) 368-0288
South-Atlantic: Regional Manager/Kate Kreve, 8304 Professional Hill Drive, Fairfax, VA 22031 (703) 573-4115, Sr. Account Executive/Pauline Smith (800) 343-6474
Midwest: Regional Manager/Pat Powers, 1011 East Touhy Avenue, Suite 360, Des Plaines, IL 60018 (708) 827-4433, Sr. Account Executive/Ellen Cross (800) 343-6474 TDD: (800) 227-9437
West: Regional Manager/Barbara Murphy, 2171 Campus Drive, Ste. 100, Irvine, CA 92715 (714) 250-0164, Sr. Account Executive/Christopher Glenn (800) 343-6474 TDD: (800) 288-5467
Computer Careers Online: Jay Sewell, Account Executive, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474

World Response Cards
375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474
Account Manager/Norma Tamburrino, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090

Computerworld Direct Inc. Promotions
Vice President/General Manager, Customer Information Division: Richard Miata, Vice President Sales: John Carpenter, Sales Assistant: Jennifer Lane.
East: Account Executive VAR Database: Carol Mullen, Database Representative, Buyers Database: Linda Clinton, (508) 879-0700 FAX: (508) 879-0100
West: Account Executive VAR Database, Chris Jones, Database Representative, Buyers Database: Gena Haas (415) 347-0555 FAX: (415) 347-8312

Reprints/Lists/Plaques
President: Charles Coleman, Chief Operating Officer: Jane Tyler (508) 626-1709 FAX: (508) 620-0027, Internet: stan@delphi.com, CompuServe: 74003,2743

International Data Group
Chairman of the Board, Patrick J. McGovern, **President,** Kelly Conlin **Chief Operating Officer,** Jim Casella, **Vice President Finance,** William P. Murphy

Computerworld is a publication of International Data Group, the world's largest publisher of computer related information and the leading global provider of information services on information technology. International Data Group publishes over 250 computer publications in 67 countries. Forty million people read one or more International Data Group publications each month. International Data Group's publications include: ARGENTINA'S Computerworld Argentina, Infoworld Argentina, AUSTRALIA'S Computerworld Australia, Australian PC World, Australian Macworld, Network World, Mobile Business Australia, Publish!, Reseller, IDG Sources; AUSTRIA'S Computerwelt Oesterreich, PC Test; BELGIUM'S Data News (CW); BOLIVIA'S Computerworld; BRAZIL'S Computerworld, Gamepro, Game Power, Mundo Unix, PC World, Publish, Super Game; BULGARIA'S Computerworld Bulgaria, Edikoved, PC & Mac World Bulgaria, Network World Bulgaria; CANADA'S CIO Canada, Computerworld Canada, Graduate Computerworld, Info Canada, Network World Canada, Reseller; CHILE'S Computerworld Chile, Informatica; COLOMBIA'S Computerworld Colombia; PC World; COSTA RICA'S PC World; CZECH REPUBLIC'S Computerworld, Elektronika, Macworld, PC World; DENMARK'S Communications World, Computerworld Danmark, LOTUS World, Macworld, Pendelavisen, Macworld Danmark, PC World Danmark, PC World Produktguide; ECUADOR'S PC World; EGYPT'S Computerworld (CW) Middle East, PC World Middle East; FINLAND'S Mikro PC, Tietoviikko, Tietoverkko; FRANCE'S Distributique, GOLDEN MAC, InfoPC, Languages & Systemes, Le Guide du Monde Informatique, Le Monde Informatique, Telecoms & Reseaux; GERMANY'S Computerwoche, Computerwoche Extra, Computerwoche Karriere, Electronic Entertainment, Gamepro, Information Management, Macwelt, Netzwelt, PC Welt, PC Woche, Publish, Unix; GREECE'S Infoworld, PC Games; HONG KONG'S Computerworld Hong Kong, PC World Hong Kong; HUNGARY'S Computerworld SZT, PC World; INDIA'S Computers & Communications; INDONESIA'S Info Komputer; IRELAND'S Computerscope; ISRAEL'S Computerworld Israel, PC World Israel; ITALY'S Computerworld Italia, Lotus Magazine, Macworld Italia, Networking Italia, PC Shopping Italia, PC World Italia; JAPAN'S Computerworld Today, Information Systems World, Macworld Japan, Nikkei Personal Computing, SunWorld Japan, Windows World; KENYA'S East African Computer News; KOREA'S Computerworld Korea, Macworld Korea, PC World Korea; LATIN AMERICA'S GamePro; MALAYSIA'S Computerworld Malaysia, PC World Malaysia; MEXICO'S Compu Edicion, Compu Manufactura, Computacion Punto de Venta, Computerworld Mexico, Macworld, Mundo Unix, PC World, Windows; THE NETHERLANDS' Computer Totaal Computable (CW), LAN Magazine, MacWorld, Totaal "Windows"; NEW ZEALAND'S Computer Listings, Computerworld New Zealand, PC World New Zealand; PC World NIGERIA; PC World Africa; NORWAY'S Computerworld Norge, CW Rapport, Lotusworld Norge, Macworld Norge, Networld, PC World Ekspress, PC World Norge, PC World Publish Guide, Publish & Multimedia World, Student Data, Unix World, Windowsworld; IDG Direct Response; PAKISTAN'S PC World Pakistan; PANAMA'S PC World Panama; PERU'S Computerworld Peru, PC World; PEOPLE'S REPUBLIC OF CHINA'S China Computerworld, China Infoworld, China PC Information Magazine, Computer Fan, PC World China, Electronics International, Electronics Today/Multimedia World, Electronics Product World, China Network World, Software World Magazine, Telecom Product World; PHILIPPINES' Computerworld Philippines, PC Digest (PCW); POLAND'S Computerworld Poland, PC World/Komputer; PORTUGAL'S Cerebro, PC Mundo, Correio Informatico, Computerworld, Guia de Bases de Dados, Informatica Comercial, Mac In; PUERTO RICO'S PC World Puerto Rico; ROMANIA'S Computerworld, PC World, Software World, Telecom Romania; RUSSIA'S Computerworld Moscow, Mir PK (PCW), Sety (Networks); SINGAPORE'S Computerworld Southeast Asia, PC World Singapore; SLOVENIA'S Monitor Magazine; SOUTH AFRICA'S Computer Mail (CIO), Computing S.A., Network News, S.A. Software World; SPAIN'S Advanced Systems, Amiga World, Computerworld Espana, Communicaciones World, Macworld Espana, NetWorld, Super Juegos Magazine (Game Pro), PC World Espana, Publish; SWEDEN'S Attack, Computer Sweden, Corporate Computing, Macworld, Mikrodatorn, Natverk & Kommunikation, PC World Publishing & Design (CAP), Datalinjeprovet, Unix Data, Windows World; SWITZERLAND'S Computerwelt Schweiz, Macwelt Schweiz, PC Tip, TAIWAN'S Computerworld Taiwan, PC World Taiwan; THAILAND'S Thai Computerworld; TURKEY'S Computerworld Monitor, Macworld Turkiye, PC World Turkiye; UKRAINE'S Computerworld; UNITED KINGDOM'S Computing/Computerworld, Connexion/Network World, Lotus Magazine, Macworld, Open Computing/Sunworld; UNITED STATES' Advanced Systems, Amiga World, Cable in the Classroom, CD Forum, CIO, Computerworld, Digital Video, DOS Resource Guide, Electronic Entertainment Magazine (E2), Federal Computer Week, GamePro, IDG Books, Infoworld, Lotus Word, Macworld, Multimedia World, Network World, PC Letter, PCWorld, Playlight, Power PC World, Publish, SWATPro, Video Event; VENEZUELA'S Computerworld Venezuela, PC World Venezuela; VIETNAMESE PC World Vietnam

Have a Problem With Your Computerworld Subscription?

We want to solve it to your complete satisfaction, and we want to do it fast. Please write to:
COMPUTERWORLD, P.O. Box 2043, Marion, Ohio 43305-2043.
Your magazine subscription label is a valuable source of information for you and us. You can help us by attaching your magazine label here, or copy your name, address, and coded line as it appears on your label. Send this along with your correspondence.

Address Changes or Other Changes to Your Subscription
All address changes, title changes etc. should be accompanied by your address label, if possible, or by a copy of the information which appears on the label including the coded line.

Your New Address Goes Here Address shown: ❑ Home ❑ Business

Name
Company
Address
City State Zip

Name
Title Company
Address
City State Zip

Other Questions and Problems
It is better to write us concerning your problem and include the magazine label. Also, address changes are handled more efficiently by mail. However, should you need to reach us quickly the following toll free number is available: **1-800-669-1002** Outside U.S. call (614) 383-3222
Computerworld customers can reach us at account number 73053, USA

Advertisers' Index

Ammer	90
Avanda	61
AST Research	89
AT&T Paradyne	77
AT&T	25-27
Cabletron	102-103
Chipcom	155
Comdisco	18
Computer Associates	5, 46-47
Computer Museum	163
CW Circulation	105
CW Classified	88, 92
CW on CD	24
D&B Software	60
Dell	78-79, 156
EMC Corp	105
Executive Technology Summit	40
Hewlett Packard	10-11
IBM	74-75, 84-85, 114-115
IDC	94
IMRS	97-98
Information Builders	33
Informix	53
Legent Software	34-35
Lexmark	96
Lotus Development Corp	82-83
Lotus Press Clippings	76
Macom	60
Micro Focus	11
Microsoft	15
NEC Electronics	106-107
NEC Technologies	118-119
Objectworld	126
Oracle	7, 9, 49
PeopleSoft	93
Progress Software	110-111
SAP America	67
SAS Institute	17, 112, 123
Silicon Graphics	96
Sterling Software	90
Sun Microsystems	42, 56-57
Sun Service	71
Sun World	52
SunSoft	64-65, 72
Sybase	21-23, 61
Symantec	20
Syncsort	3
3Com	96
Unisys	13
Watcom	100
WHITE PAPER	41-72
WordPerfect	29-31
Zenith Data Systems	86-87

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

Marketplace Advertisers' Index
Pages 144-148

Abloomp, Inc.	(800) 376-5526
American Software	(800) 284-5770
BenSight	(800) 782-5757
B.L. Associates	(617) 982-9984
Computer Marketplace	(800) 888-1144
Consultec	(800) 368-2081 X227
Cybex	(205)430-4000
Cylink Corp.	(800) 533-3958
Panorail Systems	(703) 574-9630
Xnetsoft	(800) 333-9638
NetManage	(408) 973-7171
Raritan Computer Inc.	(800) 724-8072 230
Spectra Equipment	(800) 245-1208

Companies in this issue

Page number refers to page on which story begins

1776, Inc. 108
3M Co. 73

A

ABB Power Generation, Inc. 117
Aberdeen Group 6
Adaptec, Inc. 99
Adobe Systems, Inc. 89
Advanced Micro Devices, Inc. 16
AJCorp. 116
Aladdin Software Security, Inc. 116
Albert Einstein Healthcare Foundation 116
Allstate Insurance Co. 8
Amdahl Corp. 101
American Electronics Association 28
American Express Corp. 1
Ameritech 8
Andersen Consulting 6
Anheuser-Busch Co. 1
Antec, Inc. 78
Apple Computer, Inc. 8,16,39,73,76
Applied Systems Engineering, Inc. 89
Ascend Communications, Inc. 98,99
AT&T Corp 6,24,81
Atlanta Journal-Constitution 133
AVI Systems, Inc. 32
Avis, Inc. 12

B

Barclays Bank PLC 117
BellSouth Corp 133
BioMed Data Corp. 98
BIS Strategic Decisions 91
Black & Veatch 113
Black Clawson Co. 85
Boatmen's First National Bank 91
Bolt Beranek and Newman, Inc. 4,113
Bookman Consulting, Inc. 129
Borland International, Inc. 15,32
Bose Corp. 73
Braun Technology Group 12
Brinker International 91
Bristol-Myers Squibb 129
British Airways 104
Brown Brothers Harriman & Co. 6
BrownStone Solutions, Inc. 8
Business Objects, Inc. 12
Business Research Group 113

C

C&S Networking 28
C. D. Smith & Associates, Inc. 20
Carolina Power & Light Co. 12
Carrier Corp. 61
CBD Research & Consulting, Inc. 97
CenterView Software, Inc. 116
Ceridian Corp. 104
Cheyenne Communications, Inc. 12
Cheyenne Software, Inc. 14
CIMI Corp. 28,98
Cincinnati Bell Information Systems, Inc. 1
CNN 133
Coca-Cola Co. 133
Compaq Computer Corp. 14,24,73,153
CompuServe, Inc. 73
Computer Associates International, Inc. 104,116
Computer Sciences Corp. 6
Consolidated Edison, Inc. 97
Cox Enterprises, Inc. 133
Cross International Corp. 99
CSC Index, Inc. 122
Currid & Co. 92
Cyrix Corp. 16

D

D. H. Brown Associates, Inc. 10,108
Dataquest, Inc. 101,104
Deaconess Health System 91
Dell Computer Corp. 73
Delrina Corp. 89
Digital Dealers Association 20
Digital Equipment Corp. 10,14,20,91,108
Dimensional Insight, Inc 12
Dun & Bradstreet Software 1,113
Dynatech Communications, Inc 98

E

Early, Cloud & Co. 101
Edgecomb Metals, Inc 39
ElNet 92
Elf Atochem ETO 117
Elman Wilf & Fried 1
EMC Corp 1,4
Empire Blue Cross Blue Shield 97
Ernst & Young 101,133
Euclid Associates 1

F

Far Systems, Inc. 116
Fidelity Investments 101
Firepower Systems, Inc 39
Firestone Textiles Co. 14
First Security Corp 101
Flav-O-Rich, Inc. 108
Flint Ink Corp. 12
Forrester Research, Inc 8
Forward Concepts 81
Frontier Software Development, Inc. 99
FTP Software, Inc. 28

G

G2 Research, Inc. 6
Gartner Group, Inc. 1,101
GE/Ericsson Mobidem 24
Gemini Consulting 122
General Motors Corp 6
Global Associates Ltd 133
Grumman Data Systems 28
Gruntal & Co 24
Guaranteed Overnight Delivery 108
Gupta Corp. 8,15

H

Hallmark Cards, Inc. 8
Hambrecht & Quist 151
Hawthorne Associates, Inc 117
HealthNet 12
Heuristicrats Research Inc 113
Hewlett-Packard Co. 8,14,39,76, 85,108,153
Hitachi Data Systems Corp. 101
Hitachi Ltd. 101
Hospital Health Plan Management Corp. 12
Human Serve 104
Hyperion Software Corp 8

I

I-Kinetics, Inc. 113
I/O Concepts 108
IBM 1,4,10,14,16,28,39,73,74, 91,97,101,104,108,133,153
Illuminata 108
IMRS, Inc. 8
In-Stat Research, Inc 16
Information Strategies International 133
Informer Data Security, Inc. 99
Informix Software, Inc. 4,32
Innovative Solutions & Technologies 76
Insignia Solutions, Inc. 32
InSync Software Corp. 116
Integrated Systems Solutions Corp 104
Intel Corp. 8,14,16,73,81,117
International Data Corp. 8,10,74,101,151
International Oracle Users Group 1
Intersolv, Inc. 32
Intrafed, Inc 73
Intuit Corp. 151
Inventec Group 73
Iona Technologies Ltd. 113
Ipswitch, Inc. 28

J

Johnson Controls, Inc. 81
Jones, Day, Reavis & Pogue 14

K

Kansas City Southern Railway Co. 1
Keane, Inc. 129
Kemper Securities, Inc. 39
Korn Ferry 117

L

L'Oreal S.A. 104
Legato Systems, Inc 12
Linguistic Technology Corp. 116
Link Resources Corp 24
Lioes Corp 20
Litton Computer Services 104
Lotus Development Corp. 39,104, 108,116,117

M

Manitowoc Engineering Co. 108
MapLinx Corp. 76
Martin Marietta Corp. 15,108
McKinsey & Co. 6
Mellon Bank Corp 101
Mellon Securities 129
Mercury Research, Inc. 16,39
Merrill Lynch & Co 1
Meta Group, Inc 1,39
Methodist Hospital 74
Metric Technologies 98
Mexicana Airlines 104
Micom Communications Corp. 99
Microsoft Corp 1,8,10,14,15,28,32,39,91, 108,116,117,129,133,151
MicroTouch Systems, Inc. 76,122
Mips Technologies, Inc. 8,89
Morrison-Knudsen Corp 113
Mortice Kern Systems, Inc. 116
Motorola, Inc. 4,16,39,76,91
Multimedia PC Systems 81

N

NASA 28
National Football League 1
NEC Technologies, Inc 8,14,89
Netcom On-Line Communications Services, Inc 4
NetLinks Technologies, Inc. 113
Network Peripherals, Inc 32
Network Resources Corp. 99
New York Life Insurance 129
Nissan Motor Corp 117
Northrop Grumman Corp. 85
Novell, Inc. 4,10,12,14,89,91,92,99
Nynex Corp. 97,104

O

Object Management Group 14
ObjectPlus Corp 116
Open Systems Advisors, Inc. 85
Oracle Corp 1,15,32,104,116

P

Pacific Bell 1
Paperclip Imaging Software, Inc. 73
Patricia Seybold Group 14
Peerlogic, Inc 14
Pennant, The IBM Printing Systems Co. 108
PeopleSoft, Inc. 116,133
Pepsico, Inc. 101
Performance Technology 92
PictureTel Corp 81
Pilot Software, Inc 12
Pizza Hut, Inc 101
Platinum Software Corp. 1
Platinum Technology, Inc 8
Plaza Home Mortgage Corp. 113
Powersoft 32,113,116,129,133
Pratt & Whitney 113
Process Software Corp. 28
ProSelect Resources, Inc 133

R

RAM Mobile Data USA L.P. 24
RDI Computer Corp. 76
Revelation Technologies, Inc. 116
Richardson Electronics Ltd. 1
Robertson, Stephens & Co. 91
Rockwell International Corp. 15

S

Saks Fifth Avenue 108
San Diego Supercomputer Center 4
San Francisco Canyon Co. 8
SAP America, Inc. 133,153
Scientific-Atlanta, Inc. 133
Shiva Corp. 98
Sigma Imaging Systems, Inc. 97
Silicon Graphics, Inc. 85
Sniper Corp. 108
Software Management Associates 20
Software Partners, Inc. 89
Sonix Corp. 98
Southeast Employment Network 133
SQL Access Group 32
SQL Financials, Inc. 153
Starfish Software 32
Sterling Software, Inc 116
Storage Technology Corp. 1,101,104
Sun Microsystems, Inc. 1,10,74,85, 108,153
SunSoft, Inc. 89,113
Sybase, Inc. 15,32,129,153

T

Tally Systems Corp. 14
Tandem Computers 8
TechGnosis International, Inc. 116
TechSmith Corp. 89
Telescan, Inc. 24
Televideo Systems, Inc. 32
The Chase Manhattan Bank NA 6,81,101
The Dreyfus Corp. 101
The First National Bank of Chicago 61
The Home Depot, Inc 133
The Ken Orr Institute 12
The Santa Cruz Operation 8,10,108
The Stephens Group, Inc. 98
The Well 4
The Windows Support Group, Inc. 1
Tom Snyder Productions 73
Traveling Software Corp 39
TRW, Inc. 104
TurboPowee Software 15

U

UBS Securities, Inc. 24
Unidata, Inc. 81
Unisys Corp. 6,104
United Healthcare Corp. 1
United Technologies Corp. 81
UUNet Technologies, Inc. 98

V

Vanstar Corp. 1,113
Visa International 153
Visigenic Software, Inc. 32
Vivo Corp. 81

W

Walt Disney Imagineering 73
William Blair & Co. 151
Wilson, Sonsini, Goodrich, & Rosati 14
Winchester Systems, Inc. 108
Wireless Technologies, Inc. 24
WorkGroup Technologies, Inc. 73,81,108
Worldcom Exchange, Inc. 20

X

X/Opeo Co. 10,32

Feb. 17 Stock Ticker

Gainers

Percent

4TH DIMENSION	48.6	MICROPOLIS CORP	-28.9
BROOKTROUT TECHNOLOGY	37.2	COGNITRONICS CORP.	16.6
TRIMEDYNE CORP	25.0	SAPIENS INTL CORP. N.V	-13.5
IMRS(H)	18.5	MAXTOR CORP	-12.2
HARRIS COMPUTER SYSTEMS CORP	18.2	SEQUOIA SYSTEMS INC.	-21.6
MCAFEE ASSOCIATES(H)	13.7	PARALLAN COMPUTER	-21.5
ZELBERT CORP.	13.2	FTP SOFTWARE INC.	-11.0
PICTURETEL CORP (H)	12.6	NETMANAGE INC.	-9.8

Losers

Dollar

HEWLETT PACKARD CO.	8.75	INTUIT INC.	-6.69
IMRS(H)	7.00	MOTOROLA INC.	-4.13
BROOKTROUT TECHNOLOGY	6.00	NETMANAGE INC.	-4.00
MICRON TECHNOLOGY(H)	3.63	ATMEL CORP	-3.38
ZILOG INC.	3.25	FTP SOFTWARE INC.	-3.25
ITT CORP.(H)	3.25	MICROPOLIS CORP.	-2.75
PICTURETEL CORP (H)	3.06	MICROSOFT CORP.	-1.88
BMC SOFTWARE INC.	2.81	AMERICAN POWER CONVERSION	-1.88

ORACLE CORP. STOCK ROSE SLIGHTLY FOLLOWING NEWS THAT IT HAD SIGNED A LETTER OF INTENT WITH SONY CORP. TO DEVELOP A NEW LINE OF DATABASE PRODUCTS.

[redacted]

Microsoft maintains its course

Last week's headlines on Microsoft Corp.'s (MSFT) latest brush with the antitrust brigade would have investors believe the software giant's stock just took a severe punch in the gut (see story page 1).

But the reaction on Wall Street immediately following U.S. District Court Judge Stanley Sporkin's ruling was anything but frantic. Indeed, analysts across the board seemed to sum up the ruling's stock impact as just another blip on the screen. Long-term risk, they said, will be minimal.

Analysts attributed the stock market's lackluster reaction to a general lack of surprise over Sporkin's decision.

"This judge has openly expressed his dissatisfaction with the settlement," said Neil Weintrant, an analyst at Hambrecht & Quist in San Francisco. "Some people might have expected a tremendous impact on Microsoft stock, but it clearly isn't there."

"There's a lot less here than meets the eye," said John Gantz, senior vice president of International Data Corp. in Framingham, Mass. "If anything is going to affect Microsoft's stock, it would be that Windows 95 is late."

Indeed, several analysts said they were already recommending a Hold on Microsoft stock because of Windows 95 shipping delays. Others cited the uncertainty of whether the company will be able to acquire Menlo Park, Calif.-based Intuit Corp. and the slowdown in Microsoft's upgrade momentum.

Overall, analysts described Microsoft as "very healthy." And most said they will likely maintain their Hold ratings only until things with the Justice Department settle down.

"Not knowing what the Department of Justice will do next is an unknown that adds a little bit of risk to investing right now, but in the long run, it's just another passing cloud," said Laura Lederman, an analyst at William Blair & Co. in Chicago.

"Frankly, even if they do something as draconian as splitting the company in two, it would probably just create more good investment opportunities," she said.

—Erin Callaway

Is there an industry or company you would like to see covered in Computerworld's stock column? Send your suggestions and comments to Erin Callaway via the Internet at erin@cw.com or Tim Ouellette at touel@cw.com.

EXCH	52-WEEK RANGE			FEB. 17 PRICE	WK NET CHANGE	WK PCT CHANGE
Communications and Network Services						UP 0.39%
OTC	53.25	20.11	3COM CORP	49.38	0.86	1.7
NYS	44.38	30.25	AMERITECH CORP.	42.75	-0.13	-0.3
NYS	57.13	47.75	AT&T	50.00	-1.50	-2.9
OTC	19.75	12.75	BANYAN SYSTEMS INC	17.00	0.00	0.0
OTC	43.88	18.63	BAY NETWORKS INC.	31.50	-0.13	-0.4
NYS	58.38	48.38	BELL ATLANTIC CORP	52.63	-0.75	-1.4
NYS	62.50	50.50	BELLSOUTH CORP.	58.50	-0.88	-1.5
NYS	21.50	16.00	BOLT, BERANEK & NEWMAN	16.50	-1.25	-7.1
OTC	25.75	9.00	BROOKTROUT TECHNOLOGY	14.75	4.00	37.2
NYS	53.00	33.06	CABLETRON SYSTEMS	40.75	-1.50	-3.6
OTC	43.00	18.00	CENTIGRAM COMMUNICATIONS	14.75	0.75	1.6
OTC	50.50	21.00	CHIPCOM CORP	40.88	-1.38	-3.3
OTC	40.75	18.75	CISCO SYSTEMS INC	33.75	-1.50	-4.3
OTC	23.25	6.13	COMPRESSION LABS INC	7.75	-0.25	-3.1
OTC	11.25	5.13	COMPUTER NETWORK TECH.	7.75	0.56	7.8
OTC	22.75	7.50	CROSSCOM	13.25	0.00	0.0
OTC	4.13	2.00	DATA SWITCH CORP.	3.81	0.00	0.0
OTC	50.25	17.88	DSC COMMUNICATIONS	36.75	1.00	2.8
OTC	28.50	10.00	FORE SYSTEMS INC. (H)	26.25	-1.75	-3.1
NYS	35.88	18.00	GENERAL DATACOMM INDS.	24.50	0.13	0.5
NYS	34.38	29.50	GTE CORP. (H)	33.00	-0.50	-1.5
NYS	98.25	77.00	ITT CORP. (H)	98.00	3.25	3.4
OTC	27.75	17.25	MCI COMMUNICATIONS CORP	19.63	-0.75	-3.7
OTC	15.75	7.50	MICOM COMMUNICATIONS CORP	8.75	0.75	9.4
OTC	13.25	6.50	MICROCOM INC	10.25	1.00	10.8
OTC	10.50	4.00	NETCOM CORP	8.75	0.00	0.0
OTC	6.00	3.25	NETWORK COMPUTING DEVICES	5.63	0.00	0.0
NYS	27.75	7.38	NETWORK EQUIPMENT TECH.	26.50	-0.50	-1.9
OTC	28.50	13.88	NETWORK GENERAL (H)	26.75	-0.50	-1.8
OTC	9.38	5.25	NETWORK SYSTEMS CORP	5.75	0.13	2.1
NYS	63.38	26.50	NEWBRIDGE NETWORKS CORP	40.13	1.50	3.6
NYS	37.25	26.00	NORTHERN TELECOM LTD.	34.50	-0.13	-0.4
OTC	20.25	13.88	NOVELL INC	20.13	-0.75	-3.6
NYS	40.25	33.25	NYNEX CORP	38.25	0.00	0.0
OTC	10.00	4.50	OCTEL COMMUNICATIONS CORP	7.88	0.13	0.5
OTC	37.50	12.00	OPTICAL DATA SYSTEMS INC (H)	33.25	0.00	0.0
OTC	7.50	3.13	PENRIL DATACOMM NETWORKS	3.25	-0.25	-7.1
OTC	27.31	10.00	PICTURETEL CORP. (H)	27.31	3.00	12.0
OTC	8.13	2.13	PROTEON INC.	6.13	-0.38	-5.8
OTC	12.38	2.75	RACOTEK INC.	5.00	0.38	8.1
OTC	10.50	3.50	RETIX (L)	6.19	0.38	9.8
NYS	23.25	12.88	SCIENTIFIC ATLANTA INC	21.88	0.50	2.3
NYS	44.50	37.50	SOUTHWESTERN BELL CORP	41.50	1.50	-3.5
NYS	40.13	25.88	SPRINT CORP	29.50	-0.88	-2.9
OTC	32.63	13.38	STANDARD MICROSYSTEMS CORP.	29.38	-0.50	1.9
OTC	43.75	8.50	STRATACOM INC	37.63	0.63	1.6
OTC	15.25	3.88	TELECRAFT CORP	5.50	0.63	11.8
OTC	55.50	24.00	US ROBOTICS	53.50	0.25	1.0
NYS	63.75	34.63	US WEST INC	38.88	-0.38	-1.0
OTC	28.25	12.75	XYCOM	17.00	0.75	4.6
OTC	28.88	8.06	XYLOGICS INC	24.13	-1.63	-6.3
PCs and Workstations						UP 0.93%
OTC	7.50	3.50	ADVANCED LOGIC RESEARCH	8.50	0.13	2.9
OTC	48.00	24.63	APPLE COMPUTER INC.	42.63	0.88	2.0
OTC	32.75	10.38	AST RESEARCH INC.	14.13	-0.88	-5.9
NYS	44.38	29.50	COMPAQ COMPUTER CORP.	37.00	-0.50	1.9
OTC	67.75	21.00	DELL COMPUTER CORP	45.25	1.81	4.2
OTC	25.75	9.25	GATEWAY 2000 INC	20.44	-0.63	-3.0
NYS	126.50	71.88	HEWLETT PACKARD CO	134.50	9.75	9.3
NYS	35.38	18.75	SILICON GRAPHICS (H)	26.25	1.63	6.6
OTC	37.63	18.25	SUN MICROSYSTEMS INC.	22.44	0.81	2.6
NYS	52.38	30.25	TANDY CORP	45.88	-0.25	-0.5
OTC	11.75	2.38	ZEOS INTERNATIONAL LTD	10.13	0.13	1.2
Large Systems						UP equal
ASE	12.00	5.25	AMDAHL CORP	11.25	0.50	4.7
NYS	8.88	6.38	CONVEX COMPUTER	6.25	-0.25	3.8
OTC	2.75	0.50	CRAY COMPUTER	1.06	-0.00	0.1
NYS	33.75	14.63	CRAY RESEARCH INC.	16.13	0.63	4.0
NYS	12.38	6.63	DATA GENERAL CORP.	7.88	0.50	6.0
NYS	38.75	18.25	DIGITAL EQUIPMENT CORP	35.38	-0.50	1.4
OTC	6.50	1.72	ENCORE COMPUTER CORP	2.81	-0.12	-4.3
OTC	12.50	6.50	MARIAH COMPUTER SYSTEMS CO.	10.25	2.50	18.2
NYS	78.00	51.38	IBM	75.50	0.13	0.2
OTC	37.25	5.00	NETFRAME	6.50	0.25	4.0
OTC	13.75	3.63	PARALLAN COMPUTER	5.75	6.75	11.5
OTC	16.00	5.38	PYRAMID TECHNOLOGY	15.88	0.00	0.0
OTC	21.25	11.13	SEQUENT COMPUTER SYS.	27.75	1.50	5.4
OTC	9.84	3.13	SEQUOIA SYSTEMS INC.	3.81	0.50	-11.6
NYS	39.88	22.88	STRATUS COMPUTER INC.	27.50	3.25	4.1
NYS	19.75	10.50	TANDEM COMPUTERS INC	17.38	-0.13	-0.7
OTC	22.00	3.88	TOTAL SYSTEMS	5.63	0.50	-8.2
NYS	26.50	8.25	UNISYS CORP.	9.25	-0.50	5.1
Software						UP 0.68%
OTC	38.50	21.50	ADOBE SYSTEMS INC	34.25	2.50	7.9
OTC	6.38	2.50	AMERICAN SOFTWARE INC.	2.88	0.13	-4.2
OTC	41.50	23.25	AUTODESK INC.	35.75	1.50	4.4
OTC	5.38	1.75	BACHMAN INFO. SYSTEMS	4.75	0.13	2.6
OTC	29.00	20.50	BGS SYSTEMS INC	28.00	1.50	5.7
OTC	71.00	28.75	BMC SOFTWARE INC.	60.50	2.81	4.9
OTC	30.25	15.31	BOOLE & BABBAGE (H)	29.75	1.25	4.4
OTC	15.13	6.00	BORLAND INT'L INC.	7.69	-0.25	3.1
OTC	22.25	6.88	BROCK CONTROL SYSTEMS INC.	7.50	0.19	2.6
OTC	4.00	1.78	CE SOFTWARE	3.75	0.13	3.4
ASE	30.75	16.63	CHEYENNE SOFTWARE INC.	15.00	0.00	0.0
OTC	20.88	9.75	COGNOS INC. (H)	19.69	1.19	6.4
NYS	56.00	27.38	COMPUTER ASSOCIATES (H)	55.63	1.00	1.8
NYS	6.13	2.50	COMPUTERVISION CORP. (H)	3.75	0.38	7.0
OTC	69.75	31.25	COMPUWARE CORP	37.25	0.75	2.0
OTC	27.25	8.00	CORESHARE INC.	16.50	-0.25	-1.5
OTC	16.75	10.13	COREL CORP.	12.00	0.13	1.1
OTC	24.25	7.25	DATAWARE TECHNOLOGIES INC.	12.00	1.25	11.6
OTC	6.75	2.75	EASEL CORP.	3.00	0.00	1.1
OTC	33.75	14.25	FILENET CORP. (H)	32.25	-0.50	1.5
OTC	12.50	3.00	4TH DIMENSION	6.69	2.19	48.8
OTC	19.25	10.13	FRAME TECHNOLOGY	17.13	-0.00	2.2
OTC	35.25	31.50	FTP SOFTWARE INC.	26.50	-3.25	11.0
OTC	22.00	7.00	GROUP 1 SOFTWARE	10.00	0.25	2.6
OTC	31.75	6.75	GUPTA	11.38	-0.75	-3.2
OTC	10.75	5.13	HOGAN SYSTEMS INC	5.75	0.13	2.2
NYS	44.75	18.00	IMRS (H)	44.75	7.00	18.5
OTC	28.50	11.75	INFORMATION RESOURCES	14.50	0.00	0.0
OTC	38.75	14.25	INFORMIX CORP. (H)	16.50	-1.13	1.0
OTC	13.63	7.88	INTERGRAPH CORP. (H)	13.50	0.81	6.5
OTC	8.75	2.50	INTERLEAF INC.	4.50	0.13	2.7
OTC	18.25	8.63	INTERSOLV INC.	15.75	1.13	7.7
OTC	73.75	27.00	INTUIT INC.	33.38	-4.69	-6.8
OTC	37.25	19.00	LEGENT CORP.	30.25	0.50	1.7

EXCH	52-WEEK RANGE			FEB. 17 PRICE	WK NET CHANGE	WK PCT CHANGE
OTC	86.50	29.75	LOTUS DEVELOPMENT	45.88	1.50	3.2
OTC	17.75	4.38	MAGIC SOFTWARE ENTERPRISES	5.50	0.00	1.1
OTC	15.50	8.00	MANUGISTICS GROUP INC	11.00	0.25	2.3
OTC	27.50	18.75	MAPINFO CORP.	25.25	0.25	1.0
OTC	8.75	1.44	MATHSOFT	8.06	0.31	25.0
OTC	21.00	6.50	MCAFEE ASSOCIATES (H)	20.75	2.50	13.7
OTC	17.25	9.38	MENTOR GRAPHICS	12.00	0.00	0.0
OTC	20.00	11.50	MICRO FOCUS	11.88	0.12	1.0
OTC	10.38	6.63	MICROGRAPHX INC	6.50	-0.25	3.7
OTC	65.25	39.13	MICROSOFT CORP	60.50	-1.88	3.0
OTC	42.00	11.25	NETMANAGE INC.	37.00	-4.00	-9.8
NYS	46.50	26.75	ORACLE CORP	45.69	2.56	5.9
OTC	40.25	21.50	PARAMETRIC TECHNOLOGY	38.38	2.13	5.9
OTC	24.50	13.38	PEOPLESOFT	18.25	0.00	0.0
OTC	39.50	13.00	PEOPLESOFT	39.50	-0.44	1.2
OTC	8.50	0.38	PHOENIX TECHNOLOGIES	7.88	-0.13	-1.6
OTC	87.25	35.50	POWERSOFT	74.00	2.38	3.3
OTC	14.75	3.50	PLATINUM SOFTWARE	8.38	-0.13	-1.5
OTC	24.50	11.00	PLATINUM TECHNOLOGY	24.50	1.50	6.5
OTC	56.75	27.00	PROGRESS SOFTWARE CORP	30.75	2.75	5.7
OTC	4.38	1.88	QUADTRONICS OFFICE SYS. (H)	4.12	0.25	6.5
OTC	20.75	9.50	RANDOM TECHNOLOGIES INC	17.13	0.25	1.5
OTC	8.25	2.00	RASTEROPS	8.06	-0.19	1.0
OTC	7.13	2.88	ROSS SYSTEMS	5.44	0.31	6.4
OTC	15.75	0.50	SAPIENS INTL CORP. N.V	7.00	-0.31	-13.5
OTC	28.63	8.75	SOFTKEY INTERNATIONAL INC.	26.38	0.50	2.0
OTC	7.63	1.00	SOFTWARE PUBLISHING CORP.	6.12	0.38	10.0
OTC	10.00	5.00	STATE OF THE ART	5.13	0.13	1.4
NYS	38.38	25.00	STERLING SOFTWARE INC	36.25	0.50	1.4
OTC	16.50	3.63	STRUCT DYNAMICS RESEARCH	6.50	0.00	1.0
OTC	57.00	35.25	SYBASE INC	44.63	0.00	0.0
OTC	21.50	9.88	SYMANTEC CORP. (H)	20.38	0.69	3.5
OTC	50.50	23.00	SYNOPSYS	48.81	-0.25	-0.5
OTC	29.88	10.63	SYSTEM SOFTWARE ASSOC. (H)	10.75	1.50	7.5
OTC	6.88	3.25	TENSTAC CORP	6.88	1.38	25.0
OTC	10.00	7.88	VERILOGIC SYSTEMS	10.25	0.75	7.9
OTC	23.25	12.25	WIND RIVER SYSTEMS INC.	15.88	0.13	0.8
OTC	13.25	5.50	WALKER INTERACTIVE SYSTEMS	7.13	0.50	6.6
OTC	60.00	20.25	WALL DATA INC	45.00	2.00	4.7
Semiconductors						UP 0.17%
NYS	32.25	21.00	ADVANCED MICRO DEVICES	30.69	-0.69	-2.0
NYS	24.50	16.34	ANALOG DEVICES INC	22.63	0.25	1.1
OTC	37.63	19.75	ATMEL CORP	17.63	3.38	-9.6
OTC	8.88	3.63	CHIPS AND TECHNOLOGIES	6.69	-0.06	-0.9
OTC	62.50	21.00	CIRRUS LOGIC	32.63	-0.25	-0.8
NYS	28.00	13.88	CYPRESS SEMICONDUCTOR CORP (H)	26.75	0.50	1.9
NYS	20.13	13.38	DALLAS SEMICONDUCTOR	16.13	-1.00	-5.8
OTC	31.50	16.75	INTEGRATED SILICON SYSTEMS	28.75	0.75	2.7
OTC	80.00	56.00	INTEL CORP. (H)	79.25	1.50	1.9
NYS	52.88	16.75	LSI LOGIC CORP. (H)	51.63	1.00	2.0
OTC	25.75	12.50	LATTICE SEMICONDUCTOR (H)	23.88	0.88	3.8
NYS	35.63	26.25	MICRON TECHNOLOGY (H)	35.38	3.63	7.0
NYS	63.13	42.13	MOTOROLA INC	58.00	-4.13	-6.6
NYS	25.88	16.38	NATIONAL SEMICONDUCTOR	17.75	-0.50	-2.7
OTC	22.50	6.75	SIERRA SEMICONDUCTOR (H)	21.63	6.75	1.2
NYS	89.50	63.25	TEXAS INSTRUMENTS	78.25	0.38	0.4
OTC	16.38	10.25	WSI TECHNOLOGY	13.88	-0.06	-0.4
OTC	6.75	1.78	WEITEK	3.38	0.13	3.8
ASE	20.38	11.50	WESTERN DIGITAL CORP.	15.88	-0.63	3.8
OTC	65.25	29.00	XILINX (H)	63.88	1.13	1.8
OTC	17.75	24.75	ZILOG INC.	11.25	3.25	10.0
Peripherals and Subsystems						OFF 1.43%
OTC	16.50	14.50	AMERICAN POWER CONVERSION	14.13	1.88	0.4
OTC	97.25	15.75	BARRETT INC	16.75	0.00	0.0
OTC	5.75	2.25	CAMBEX CORP	3.88	0.13	3.3
ASE	5.00	1.50	CENTRITECH CORP	2.88	0.56	-16.4
NYS	20.50	9.00	CONNER PERIPHERALS	10.50	-0.13	1.2
OTC	24.00	8.75	CREATIVE TECHNOLOGIES INC.	12.00	-0.88	-7.0
OTC	9.50	3.50	DATA RACE INC.	8.50	0.13	-1.9
ASE	7.63	4.13	DATAPOINT CORP	7.63	-0.29	-4.3
NYS	24.00	12.50	EMC CORP	16.00	-0.50	-3.0
OTC	35.12	9.13	EMULEX CORP. (H)	14.75	-0.50	3.6
OTC	17.50	21.75	EVANS & SUTHERLAND	12.63	0.63	5.2
OTC	24.00	16.88	EXABYTE	17.25	0.75	4.2
OTC	28.13	1.88	INTELLIGENT DATA SYSTEMS	1.94	-0.06	3.6
OTC	6.00	1.50	IOMEGA CORP	4.50	-0.19	3.1
OTC	9.00	2.00	IPL SYSTEMS INC	4.88	0.50	11.4
OTC	29.50	17.00	KOMAG INC	21.00	6.00	-0.0
OTC	8.63	2.81	MAXTOR CORP	4.50	-0.62	-12.2
OTC	11.50	6.88	MICROPOLIS CORP	8.75	2.75	28.9
OTC	20.25	9.25	PRINCETON GRAPHICS INC	11.50	0.38	3.7
NYS	28.75	4.81	PYRAMID TECHNOLOGY	10.25	1.50	17.0
NYS	10.75	6.88	QMS INC	7.50	-0.38	4.8
OTC	20.25	11.63	QUANTUM CORP	15.00	-0.75	3.8
OTC	18.25	7.38	RADIUS INC	16.00	1.00	2.7
NYS	14.13	6.88	RECOGNITION INTERNATIONAL	7.50	-0.38	4.8
OTC	7.88	4.13	SILICON INC.	5.00	-0.50	-6.9
NYS	28.75	18.63	SEAGATE TECHNOLOGY	24.38	0.75	1.0
NYS	65.50	21.00	STORAGE TECHNOLOGY	22.25	-0.00	3.8
NYS	40.50	24.88	TEKTRONIX INC	34.38	1.00	2.6
NYS	112.75	90.63	XEROX CORP	100.63	1.38	1.9
Services						OFF 1.16%
OTC	20.88	17.31	AMERICAN MGMT SYSTEMS (H)	18.63	1.50	7.5
NYS	4.25	1.75	ANACOMP INC	2.38	0.31	5.6
OTC	21.75	14.50	ANALYSTS INT'L	20.00	0.00	0.0
NYS	62.25	47.62	AUTO DATA PROCESSING (H)	51.50	-0.19	1.2
OTC	31.00	14.00	CAMBRIDGE TECH PARTNERS (H)	26.50	6.50	1.0
NYS	30.63	20.50	CERIDIAN CORP.	30.13	0.19	1.3
NYS	26.12	17.75	COMDISCO INC (H)	25.25	-0.25	-1.0
OTC	18.00	8.25	COMPUTER HORIZONS	15.00	-0.25	2.7
NYS	52.63	35.13	COMPUTER SCIENCES	50.13	0.38	0.7
NYS	30.50	7.50	COMPUTER TASK GROUP	9.00	-0.25	2.6
NYS	22.25	6.75	COMPUSA INC.	18.00	0.25	0.7
OTC	11.38	5.38	CONTROL DATA SYSTEMS INC	7.13	-0.13	1.7
OTC	12.12	8.13	ELECTRO DISCOUNT SOFTWARE	20.75	-0.50	4.4
NYS	40.13	31.02	GENERAL MOTORS (EDS)	39.25	-0.38	-0.9
OTC	26.00	6.88	IMAGING CORP	9.50	0.13	1.5
OTC	27.13	7.50	INTELLIGENT ELECTRONICS	8.88	0.00	0.0
OTC	22.50	6.25	MCAFEE	6.75	0.50	-6.9
OTC	32.50	9.25	MICRONAE INC	8.50	-0.94	-8.9
OTC	42.00	28.50	PSYCHEM	41.00	0.25	0.6
NYS	47.75	25.75	POLICY MANAGEMENT SYS.	42.88	-0.38	-0.8
NYS	28.25	19.75	REYNOLDS AND REYNOLDS (H)	26.13	1.00	4.1
OTC	25.25	16.75	SEI CORP	18.03	2.43	8.8
OTC	37.88	22.12	SHARED MEDICAL SYSTEMS (H)	34.88	1.00	1.0
OTC	8.13	6.00	SHL SYSTEMHOUSE	6.69	0.06	1.1
OTC	21.50	9.75	SOFTWARE SPECTRUM INC.	21.00	1.13	5.7
OTC	41.75	31.50	SUNGARD DATA SYSTEMS (H)	40.50	0.00	0.0

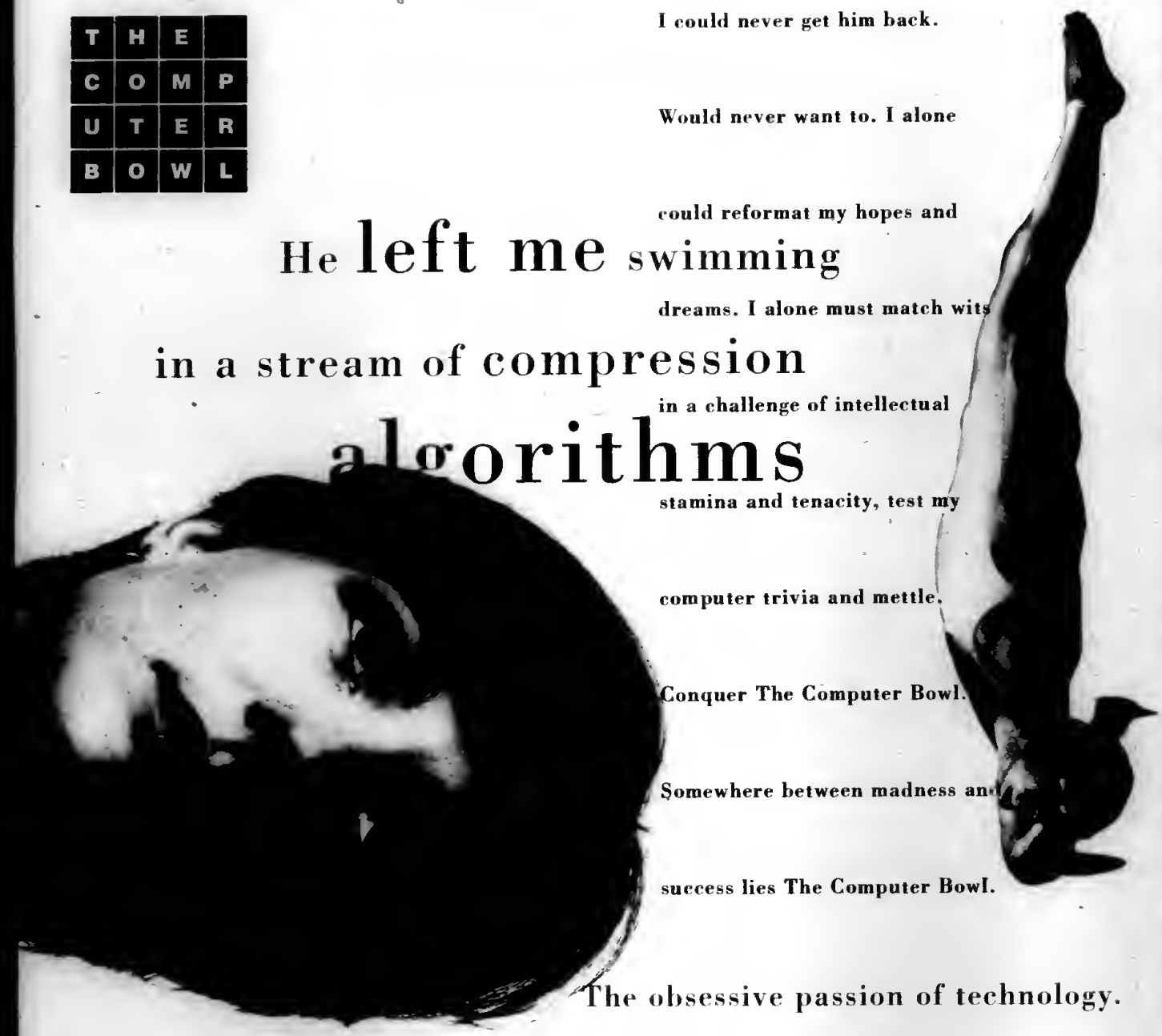
KEY: (H) = New annual high reached in period (L) = New annual low reached in period

COPYRIGHT NORDBY INTERNATIONAL INC., BOULDER, COLORADO
THIS INFORMATION IS BASED ON SOURCES BELIEVED TO BE RELIABLE, AND WHILE EXTENSIVE EFFORTS ARE MADE TO ASSURE ITS ACCURACY, NO GUARANTEE CAN BE MADE THEREOF. INTERNATIONAL AND COMPUTERWORLD ASSUME NO LIABILITY FOR ANY INACCURACIES. FOR INFORMATION ON NORDBY'S CUSTOMIZED FINANCIAL RESEARCH SERVICES, CALL 1 (800) 926 7404.

Second-class postage paid at Framingham, Mass., and additional mailing offices. Posted under Canadian International Publication agreement #0018697. Computerworld (ISSN 0010-4841) is published weekly, except a single combined issue for the last week in December and the first week in January by Computerworld, Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. Copyright 1994 by Computerworld, Inc. All rights reserved. Computerworld can be purchased on microfilm and microfiche through University Microfilms Inc., 300 N. Zeeb Road, Ann Arbor, Mich. 48106. Computerworld is indexed. Back issues, if available, may be purchased through the circulation department. Photocopy rights: permission to photocopy for internal or personal use is granted by Computerworld, Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article, plus $.50 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, MA 01970. Requests for other uses, including requests to reprint may be purchased from Sharon Bryant, Computerworld, Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. Requests for missing issues will be honored only if received within 60 days of issue date. Subscription rates: To be a copy: U.S. – $48 a year. Canada – $110 a year. Central & So. America – $150 (surface) a year. Europe – $295 a year; all other countries – $395 a year. Subscriptions can only be filled one year at a time. POSTMASTER: Send Form 3579 (Change of Address) to Computerworld, P.O. Box 2044, Marion, OH 43305

THE COMPUTER BOWL

He left me swimming in a stream of compression algorithms



I could never get him back.

Would never want to. I alone could reformat my hopes and dreams. I alone must match wits in a challenge of intellectual stamina and tenacity, test my computer trivia and mettle.

Conquer The Computer Bowl.

Somewhere between madness and success lies The Computer Bowl.

The obsessive passion of technology.

Sponsor The Computer Bowl, April 20. Broadcast on "Computer Chronicles." Check your local PBS listings for day and time. Ten industry leaders in a contest of computing and trivia knowledge to benefit The Computer Museum, Boston.

Call 415-323-1909, or e-mail welsh@tcm.org. Presented by Apple Computer.®

[redacted]

Film output and production: Wace USA/Walker Graphics.

Oracle

CONTINUED FROM PAGE 1

at least three years. Oracle has yet to officially announce Oracle 8, but analysts predict it will ship in 12 to 15 months.

"Ellison has been selling Oracle 8 since Oracle 6 came out," said Herb Edelstein, an analyst at Euclid Associates in Potomac, Md. "Ellison is always going around writing checks that other people have to cash."

Still, some large Oracle shops said they hope Sedona's release will mean payday has arrived.

Oracle users want to buy true object-oriented tools from their primary database supplier instead of buying bits and pieces from smaller third parties and then worrying about integration with Oracle's relational database, they said.

Merrill Lynch & Co., for example, has been looking for definitive object-oriented moves from Oracle for some time, said Tony Ziemba, a database technology analyst at Merrill Lynch's investment banking unit in New York. "If I start to do something here with object-oriented tools, I want to know I'm not cutting myself off from the future of Oracle," Ziemba said.

Today, the group uses various tools from different vendors to build investment tracking and forecasting systems. A lack of Oracle-built object products has not stopped Merrill Lynch from dabbling with object technology, "but it sure would be easier if we could get integrated tools all [from] one source," Ziemba said.

Sedona would, in theory, provide such integration as well as a built-in object-relational translation layer, Ziemba said. Merrill Lynch was one of 20 large Oracle customers briefed on the project.

"I can't tell you how important it is to hear from Oracle about real objects. What there is today ... isn't very much," said Bob Heister, a senior technical consultant at Cincinnati Bell Information Systems, Inc., the computing unit of Cincinnati Bell.

With the Sedona framework, Cincinnati Bell could keep an active rather than static repository of objects, he said. The repository could hold and continuously update at least two types of objects — business rules and production data — and propagate changes out to customer service and other applications.

Yet Oracle should take care not to invent and push an object framework that does not play well with others, Heister added.

Indeed, Oracle is pulling in help from other vendors to provide key parts of Sedona. Sun is helping to form Object Mediator, a message-based translator, according to Abbasi. Object Mediator would, for example, let objects created with Sedona tools communicate with objects built under Sun's Project Distributed Objects Everywhere.

Key to Sedona is a repository designed to carry out several functions. It would act as a sort of factory where object pieces and models could be assembled and kept until it received messages from applications to invoke them. The repository would also be a way to unite Oracle's enterprise-level Cooperative Development Environment (CDE) tools with Power Objects, Oracle's low-end development tool introduced last month, Abbasi said.

Such integration would be crucial for developers trying to build large, companywide applications, said Jeffrey Jacobs, president of the International Oracle Users Group's computer-aided software engineering (CASE) special interest group.

As it stands, Oracle's existing development tools lack integration. For example, developers who want to build a screen with Oracle's CDE Forms generator must dock out of the tool and launch the appropriate Oracle CASE product to get hold of data attributes such as fonts and colors housed in the Oracle CASE dictionary, he explained.

"That shouldn't be," said Jacobs, an independent Oracle consultant in Belmont, Calif. "And that's what we don't want to continue with Oracle's next generation of products."

On tap

Other object plans at Oracle include integrating Austin, Texas-based UniSQL, Inc.'s hybrid object-relational database with Oracle 7 late this year. Oracle signed a deal last November to resell UniSQL products to oil and gas companies.

NetBill trial run planned for fall

By Ellis Booker

Visa International and Carnegie Mellon University announced plans last week to conduct a trial run of NetBill, Carnegie Mellon's prototype system for billing buyers for small, on-line transactions.

While ordinary credit cards are used today to purchase goods on the Internet, this approach is not suitable for low-cost items such as a page of text or a single database query because the minimum transaction fee for credit cards averages about 30 cents.

"So if you want to sell the page for a dime, you have to mark it up to 40 cents to cover the cost," said Marvin Sirbu, professor of engineering and public policy and industrial administration at Carnegie Mellon. Sirbu and Doug Tygar, an associate professor of computer science, are the directors of the NetBill project.

Although the test this fall will principally involve digital libraries at several universities, both Visa and Carnegie Mellon said they are interested in learning the technical, legal and regulatory issues involved in the wide-scale deployment of an on-line payment system.

"Visa wants to see if this approach works and [if it] is economical," said Bill Powar, vice president of advanced payment system strategies at Visa. Powar said Visa's long-term objective is to add a NetBill capability to standard Visa accounts.

Additional information about NetBill can be obtained at Carnegie Mellon's World-Wide Web site: http://www.ini.cmu.edu/netbill/.

Users build

CONTINUED FROM PAGE 1

bers of users, on-line transaction performance and decision-support response times. While these tests often boast impressive numbers, the results do not provide users with meaningful comparisons with other applications.

However, more serious help appears to be on the horizon with the promise of an independent client/server performance measurement. The Transaction Processing and Performance Council (TPC), for example, has targeted late this year for delivery of its benchmark.

Kim Shanley, chief operating officer of TPC in San Jose, Calif., said the benchmark will measure a "medium level of complexity" for on-line transactions in a client/server environment. It could include up to thousands of users connected via LANs doing "a variety of light to mid-weight transactions, including reads and writes," Shanley said.

In the meantime, a user's best bet is to tackle the job on his own. Based on interviews with several users and industry analysts, the following tactics are now being used to get a fix on an application's performance:

- Conducting modified benchmarks in-house that focus only on certain aspects of an application to save time and money.
- Basing a software contract on the successful completion of an in-house test of the vendor's product or requesting that the vendor run tests up front as part of the deal.
- Considering other users' test results to compare different systems.

But even with these approaches, the job is still difficult because of the complexity of client/server systems.

In the host-based world, the key elements to measure were typically transactions or such systems capabilities as I/O performance. In client/server, performance factors to test include numbers of users, on-line transactions, type of network, network traffic, decision-support queries and end-user applications.

"I do wonder if there are any client/server installations that are enough alike where a benchmark would help us," said Kevin Reilly, vice president of information systems at Richardson Electronics Ltd. in LaFox, Ill. He has been shopping for client/server applications since mid-1994.

The cost factor

Another potential problem is cost. Although Thornton declined to provide exact dollar amounts, he said the testing phase of his software selection ate up about 15% to 20% of the total cost of buying and implementing his client/server system.

Industry analysts said a 20% cost would likely include a full-scale test and pilot. Users can actually plan on spending less, particularly if they bargain with potential vendors to share testing expenses.

John Christopherson, director of IS planning at United Healthcare Corp. in Minneapolis, said he avoided the "very expensive proposition" of testing multiple applications in-house by zeroing in on a particular company's product and working closely with the vendor to test the software. In this case, it was SmartStream from Dun & Bradstreet Software in Atlanta.

"You need to crawl all over the software vendor's architecture and understand where the likely bottlenecks will be," Christopherson said.

One successful tactic that some observers cited is basing a contract with a potential software provider on its ability to test the software and show satisfactory results — before signing on the dotted line.

For users who do not have the time or resources to perform their own tests, some software providers will do a comparison test for a fee. Oracle Corp. in Redwood Shores, Calif., for example, will run tests on its own client/server financial applications on different platforms as well as against other vendors' products.

No apples to apples

Benchmarking efforts from application vendors include the following:

- **SAP America, Inc.** released a benchmark for R/3 supporting 1,000 users on a Hewlett-Packard Co. four-way HP Corporate Business Server and HP 9000 Model G50 servers. It is typical today for a client/server application to support 100 to 200 users.
- **SQL Financials, Inc.** reported that its general ledger clocks in at 50 to 59 transactions per second, or about 1 million transactions in approximately five hours. The tests were completed on a Sun Microsystems, Inc. SPARCserver 1000 running Sybase, Inc.'s System 10.
- **IBM** announced its AS/400 performed 50% faster in tests against systems from both HP and Compaq Computer Corp. The benchmark measured a collection of processes, including transaction processing, decision support and file serving.

Wysiwyg

Spelling bee

A number of readers sent in interesting suggestions that their spell checkers made. Here are some shining examples of computer technology at work:



Instead of saying "All computer systems will be barcoded" for inventory purposes, a document was published stating "all computer systems will be barricaded..."

– *Jim Vecht, Seattle*

Co-workers by any other name ...

The spell checker choked on the word "boldfacing" and suggested the word "bloodsucking" as an alternative. Then it stopped on "coworkers" and thought perhaps I really meant to say "cowpokes." I realize I am from Texas, home of the quaint country phrase, but I still don't refer to my colleagues as cowpokes! (Bloodsuckers, maybe, but never cowpokes!)

– *Linda Mustholer, Houston*

While working in the UK for a hospital's software vendor, when the word "colleagues" was used in a document, the UK lexicon would return "scalawags" as an option.

– *John Harding, Marietta, Ga.*

Name-calling

I get some interesting suggestions for my last name, "Togasaki." The complete list of suggested corrections is: Goatsucker, Galactoside, Tackiest, Gawkiest, Talkiest, Toadstool. Do you think they're trying to tell me something?

– *John Togasaki, Mountain View, Calif.*

Both Microsoft Word and WordPerfect will attempt to replace the name "Myron" with the word "moron." Of course, Myron is the first name of our director of human resources. It makes me laugh every time it comes up.

– *Angela Toomer, Montclair, N.J.*

When I checked the spelling of a letter to one of my U.S. senators, ClarisWorks did not recognize the name "D'Amato" and offered only two alternatives: "dimwit" and "demote."

– *Tom Olin, Waterville, N.Y.*

Best little *what* in Texas?

Bob O'Hern of Beltsville, Md., accidentally typed "wharehouse" and was told whorehouse was a better replacement.

WYSIWYG compiled by Tim Ouellette. Illustration by David Waugh

How to contact *Computerworld* editors:

	Phone:	Fax:
Main office, Framingham, Mass.	(508) 879-0700	(508) 875-8931
24-hour tip line	(508) 820-8555	
Mid-Atlantic bureau, Rochelle Park, N.J.	(201) 587-0090	(201) 712-1808
Washington bureau, Washington	(202) 347-0134	(202) 347-2365
Midwest bureau, Des Plaines, Ill.	(708) 827-4433	(708) 827-9159
West Coast bureau, Burlingame, Calif.	(415) 347-0555	(415) 347-6831
Northwest bureau, Bellevue, Wash.	(206) 641-7770	(206) 747-1021

☞ **Electronic mail:** *Computerworld*'s writers and editors have individual **MCI Mail** accounts. Most of our staff members can be reached on MCI Mail by addressing messages to their first and last names as they appear on the masthead, which is opposite the editorial page. For a complete list of editorial MCI Mail addresses, message Linda Gorgone at 597-8014.

☞ Our **CompuServe** account number is 76537,2413. Please use that account only for communications with writers and editors. Computerworld cannot guarantee response to all inquiries. Direct subscription inquiries to CompuServe: 73373,1230.

☞ **Letters to the editor** and other editorial-related messages can be sent via **Internet** to letters@cw.com

☞ **Client/Server Journal:** Contact Editor Alan Alper at (508) 820-8115 or via Internet at aalper@cw.com

☞ **Subscriptions:** Inquiries and changes of address should be sent to P.O. Box 2043, Marion, Ohio 43305-2403 or call (800) 669-1002.

☞ **Reprints:** Contact Sharon Bryant at (508) 820-8125.

☞ **Rapid Reference clipping service:** (800) 343-6474 x554.

Inside Lines

August launch anticipated for OS/2 4.0

Faced with the looming threat of Microsoft's Windows 95, IBM will release in August the 4.0 version of OS/2 that will be able to run Windows 95 and Windows NT, a report last week in *Computerworld Norge* in Oslo said. The story cites internal IBM sources and notes that IBM has rescheduled the launch in order to steal thunder from Microsoft's Windows 95 unveiling, also slated for August.

Playing well with others ... for a change

Next Computer is expected this week to announce plans to make the NextStep and OpenStep object-oriented systems comply with Common Object Request Broker Architecture standards, according to sources close to the company. Such compliance could help bring Next into corporate IS, which is increasingly demanding that enterprise-level tools play well with others. Word has it, too, that Next CEO Steve Jobs will crow a bit about his company's financial health, which is estimated to be good — sales topped $40 million in 1994, making it Next's first profitable full year.

Sybase bellies up to client/server partners

Sybase is seeking an entree into the exploding client/server applications market, but unlike rival Oracle, it will not build such packages itself. Instead, the Emeryville, Calif., vendor is expected next month to unveil tight partnerships with selected financial, manufacturing and other applications makers to push packages supporting its System 10 and upcoming System 11 databases, sources close to the firm said. PeopleSoft, Avalon and others will get engineering help to port their applications to Sybase's database.

This is a stack-up

IBM's expected delay in completing a promised volume-stacking capability for its upcoming NTP high-capacity tape drive is encouraging rival Storage Technology to take a crack at developing a similar feature for its new RedWood tape device. StorageTek previously said RedWood would not support volume stacking, which lets commercial users put multiple logical tape volumes on a single cartridge. But the firm is striving to make RedWood into more than just a niche product for government spooks and seismic macho-processors. A tape marketing exec now says the firm hopes to have stacking in place by early 1997. IBM's stacking feature may not be ready until the second half of next year, analysts said.

How about some syrup with that Intel waffle?

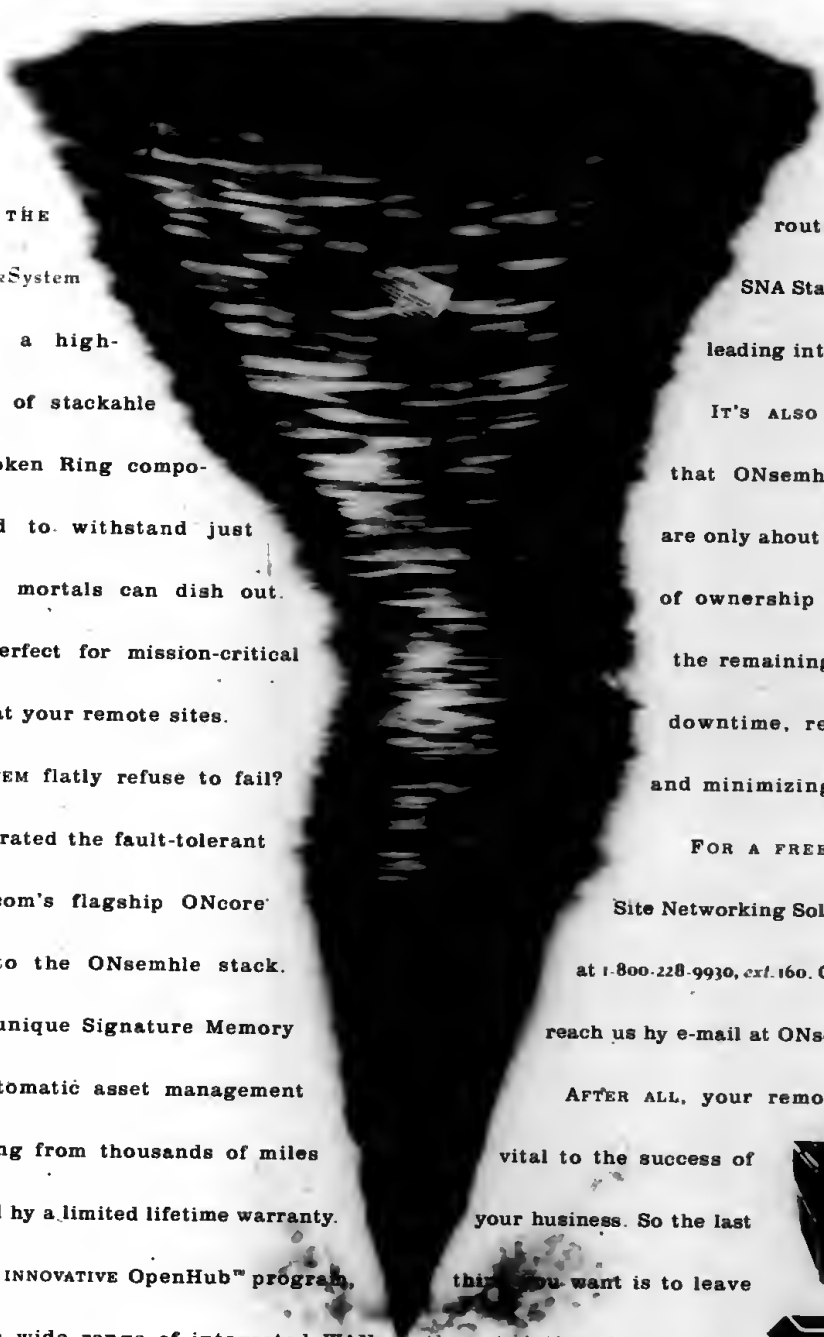
Intel's mobile strategy is starting to look like a multidirectional seesaw, which means higher development costs for vendors and, ultimately, higher prices for users. The firm has made three attempts in the past four years, and while it now is focusing on bringing Pentium to the notebook market, sources say it will change its strategy again in the near future. Intel plans to integrate its chips with the chip sets that support its processors, preventing vendors from using Cyrix and AMD processors in the same board designs.

Brighter OutLook from Banyan

Banyan Systems will next week unveil a network management package called OutLook 1.0, which runs on Hewlett-Packard's OpenView. OutLook will provide Vines users with real-time graphical views of the enterprise network, said Jeff Liotta, Banyan's director of network management. The package requires either Vines or ENS for NetWare. OutLook is one component of Banyan's overall network-based Distributed Enterprise Management Architecture platform, which was introduced last summer.

A user wag, weary of the continued slippage of Windows 95 toward 1996, proposed that Microsoft could avoid potential packaging losses by rechristening the prodigal operating system "WinEver." The money saved could then be used to expand Microsoft's stable of vaporware engineers, he suggested. To pass along other brilliant ideas or just a news tip or two, you can reach Computerworld *on our 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News editor Maryfran Johnson can be reached by phone at (508) 820-8179 or via the Internet at mjohnson@cw.com.*

WITH ONsemble StackSystems at your remote sites, acts of God are the only things that could cause them to fail. (So, how good have you been lately?)



INTRODUCING THE ONsemble™ StackSystem from Chipcom, a high-function system of stackable Ethernet and Token Ring components designed to withstand just about anything mere mortals can dish out. Which makes them perfect for mission-critical applications running at your remote sites.

WHY DOES THIS SYSTEM flatly refuse to fail? Because we've incorporated the fault-tolerant architecture of Chipcom's flagship ONcore® Switching System into the ONsemble stack. We've even built our unique Signature Memory into the stack for automatic asset management and fast troubleshooting from thousands of miles away. And it's all backed by a limited lifetime warranty.

PLUS, THANKS TO OUR INNOVATIVE OpenHub™ program, you can choose from a wide range of integrated WAN routing, remote access and SNA StackSystem solutions from leading internetworking vendors.

IT'S ALSO REASSURING to know that ONsemble StackSystem costs are only about 5% of the lifetime cost of ownership and will help shrink the remaining costs by eliminating downtime, reducing service calls and minimizing administration.

FOR A FREE COPY of our Remote Site Networking Solutions brochure, call us at 1-800-228-9930, *ext.* 160. Or, if you prefer, you can reach us by e-mail at ONsemble@chipcom.com.

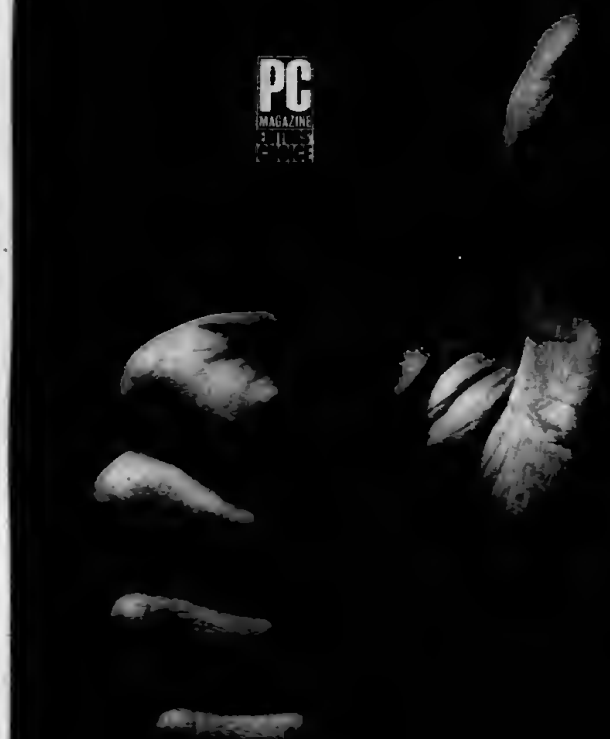
AFTER ALL, your remote site networks are vital to the success of your business. So the last thing you want is to leave them twisting in the wind.



CHIPCOM™

©1995 CHIPCOM CORPORATION. ALL RIGHTS RESERVED. CHIPCOM CORPORATION HEADQUARTERS OFFICE, 118 TURNPIKE ROAD, SOUTHBOROUGH, MA 01772. CHIPCOM UK TEL: 800 445 8800. CHIPCOM EUROPE TEL: 44 101 494 704494. CHIPCOM GERMAN TEL: (08 8)166 7618. THE CHIPCOM LOGO, ONSEMBLE AND OPENHUB ARE TRADEMARKS AND CHIPCOM AND ONCORE ARE REGISTERED TRADEMARKS OF CHIPCOM CORPORATION. OTHER PRODUCT NAMES MENTIONED ARE TRADEMARKS OF THEIR RESPECTIVE COMPANIES.

THIS TIME PC MAGAZINE GAVE US THE FINGER.





DELL® LATITUDE™
IntelDX2™ 50MHz System
- 9.5" Dual Scan Color Display
- 8MB RAM/340MB Upgradeable HDD
- 1 Year Warranty†

$2428
Product Code: #600038

DELL LATITUDE
IntelDX2 50MHz System
- 9.5" Dual Scan Color Display
- 4MB RAM/260MB Upgradeable HDD
- 1 Year Warranty†

$1999
Product Code: #600022

DELL LATITUDE
IntelSX™ 33MHz System
- 9.5" Dual Scan Color Display
- 4MB RAM/260MB Upgradeable HDD
- 1 Year Warranty†

$1799
Product Code: #600009

When will the finger pointing end? First *PC Week* singled out our Dell Latitude XP™ notebook for their Analyst's Choice Award. Then Latitude XP survived and conquered *PC Computing*'s Notebook Hell. Now our value model, the Dell Latitude, has won *PC Magazine*'s most recent Editors' Choice Award. After competing with over 60 portables, the Latitude prevailed as the new standard in value.

Value that we've improved by lowering our prices even more on the Latitude notebook than when *PC Magazine* reviewed it.

Value our superior engineering has created with a removable floppy drive that can be replaced by a second battery, providing longer battery life.

To order any one of our award-winning Dell Latitude notebooks, call today. Everyone seems to be pointing in our direction.

DELL

(800) 545-6095 KEYCODE #12025 MONDAY-FRIDAY 7AM-9PM CT • SATURDAY 10AM-6PM CT • SUNDAY 12PM-5PM CT • CANADA* CALL 800-387-5755 • MEXICO CITY* CALL 800-228-7811

*For a complete copy of our Limited Warrantees please write to Dell Computer Corporation, 2214 W. Braker Lane Bldg. 3, Austin, TX 78758 *Reprinted from PC Magazine 1/24/95 •Prices valid in the U.S. only. Some products and promotions may not be available outside the U.S. Prices and specifications subject to change without notice. The Intel Inside logo is a registered trademark and IntelDX2 and IntelSX are trademarks of Intel Corporation. Dell disclaims proprietary interest in the marks and names of others. ©1995 Dell Computer Corporation. All rights reserved.